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UK METEOROLOGICAL OFFICE
GLOBAL DATA MONITORING REPORT

June 1998

Data Assimilation
Meteorological Office
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10th July 1998

Dear all,

Please find enclosed the monthly monitoring report for June 1998.

A correction to the processing of sonde data has resulted in a decrease in the number of 500hPa geopotential heights in Figure 8 of approximately 230 from the values seen in previous month's reports. There has also been a small increase in the number of 300hPa winds in Figure 9 of between 15 and 30. We apologise for not having found and corrected this error sooner.

Should you have any questions concerning the reports, please contact me at the address below.

Best regards.

Bruce Macpherson.

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1. Introduction

As the WMO-appointed lead centre for monitoring surface marine data, the U.K. Meteorological Office produces monthly statistics on the quality of these observations received at RSMC Bracknell. This report includes this information along with statistics for most other types of data. The figures and tables contained herein are presented according to the agreed standards for the exchange of monitoring results.

The report is based on data received at the UK Meteorological Office Headquarters, Bracknell in time for inclusion into the appropriate analysis. The evaluation of data quality is based on comparison with the appropriate 6-hour global model forecast (background field). Generally, the background field is of high quality except in data sparse areas, tropical regions and areas close to steep orography where care should be taken in interpreting the statistics shown.

Comments or queries on the report are welcome and should be addressed to:-

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2 Global Data Monitoring Statistics

Ships, Fixed buoys, Platforms and Drifting buoys observations

TABLES 1-2 contain lists of the stations which are considered to have returned suspect observations of pressure, windspeed, wind direction or temperature, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 1 and 2 show 10 degree lat/long box average numbers of SHIP/SYNOP and DRIFTER observations received per day throughout the month at Bracknell and assimilated into model runs. Only data from the main hours of 00 UTC, 06 UTC, 12UTC and 18 UTC are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Synop Observations

Table 3 contains a list of stations which are considered to have returned suspect observations of Pressure during the month. The criteria for quality control are given in the header page. The reporting practice of each station is included in the list of statistics.

At RSMC Bracknell, for synoptic stations at or below a height of 500 metres, reported mean sea-level pressure is used in the statistics. If this is unavailable the mean sea-level pressure is calculated from the reported station-level pressure and temperature.

For synoptic stations above 500 metres, the mean sea-level pressure is calculated from the reported station-level pressure and temperature, or, if these are not available the height of a standard pressure-level (e.g.: 850 hPa or 700 hPa). If neither of these are available, the reported mean sea-level pressure is used.

Some stations vary their reporting practice according to the observation hour (e.g.: some stations in the CIS report both mean sea-level and station-level pressure at 00 & 12 UTC, but only mean sea-level pressure at 06 & 18 UTC). For monitoring purposes, reported mean sea-level pressure is stored separately from that calculated from station-level pressure or height of a standard pressure-level. Only statistics for the preferred method (see above) are presented in this report, and so for certain high-level stations, such as those from the CIS, approximately half of the number of observations actually received will appear in the statistics.

Aircraft observations

TABLE 4 contains a list of statistics calculated from data received from all airline carriers.

Figure 3 shows 10 degree lat/long box average numbers of aircraft reports (in AIREP/AMDAR code, including AIREPs, ACARs, AMDARs and ASDARs) received per day throughout the month at Bracknell and assimilated into model runs in the layer 70-500 hPa. Observations with a vector wind difference (compared with the model background field) of >60 m s^{-1} have been excluded. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Figures 4-7 show wind statistics for AIREP/ASDAR (in AIREP/AMDAR code, including AIREPs, ACARs, AMDARs and ASDARs) in the layer 70-500 hPa. Observations with a vector wind difference > 60 m s^{-1} have been excluded. Statistics have not been calculated for 10 degree lat/long boxes containing <31 observations.

Figure	Parameter
4	Mean wind vectors
5	Mean observation - background wind vector
6	Mean observation-background speed (m s^{-1})
7	RMS observation-background vector (m s^{-1})

Radiosonde Observations

TABLES 5-7 contain lists of the stations which are considered to have returned suspect observations of geopotential height, vector wind or wind direction, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 8 and 9 show 10 degree lat/long box average numbers of TEMP 500 hPa GEOPOTENTIAL HEIGHT and TEMP/PILOT 300 hPa WIND observations received per day throughout the month at Bracknell and assimilated into model runs. Data from all hours are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

APPENDIX I shows details of the gross error limits used in TABLES 5 and 6 and the weights used in the RMS values in TABLE 5.

Satellite Observations

Figures 10-24 show satellite wind statistics for all geostationary satellites. All plots other than **AVAILABILITY** show average data where there are > 10 observations in a 10 degree lat/long box.

Figure	Parameter Plotted	Layer (hPa)
10	Availability/average daily number	701-1000
11	Vector mean wind (observed)	701-1000
12	Observation-background vector wind difference	701-1000
13	Mean observation-background speed differences	701-1000
14	RMS observation-background vector difference	701-1000
15	Availability/average daily number	401-700
16	Vector mean wind (observed)	401-700
17	Observation-background vector wind difference	401-700
18	Mean observation-background speed differences	401-700
19	RMS observation-background vector difference	401-700
20	Availability/average daily number	101-400
21	Vector mean wind (observed)	101-400
22	Observation-background vector wind difference	101-400
23	Mean observation-background speed differences	101-400
24	RMS observation-background vector difference	101-400

Figures 25-27 show satellite mean observation-background temperature differences for NOAA-11 soundings at 500 km resolution and figures 28-30 show the same statistics for NOAA-14. Data are plotted where there are > 30 observations in a 10 degree lat/long box.

N.B. 500 km SATEMs are no longer assimilated into the UKMO global Unified Model. Both 500 km and 120 km SATEMs were replaced on 16th April 1996 by 120 km resolution temperature profiles produced locally from the radiances disseminated by NESDIS (from NOAA-11 and NOAA-14).

Figure	Layer (hPa)
25/28	850-1000
26/29	100-300
27/30	30-50

3 Composite Observing Systems for the North Atlantic (COSNA)

This section shows statistics for upper air (radiosonde and aircraft) and surface (drifter) data for the North Atlantic area for data received at Bracknell during the month.

TABLE 8 shows quality statistics for **Mean Sea-level Pressure, Windspeed and Wind Direction** received at Bracknell in DRIFTER code during the month for the area 10°N - 80°N, 85°W - 0°W.

TABLE 9 shows quality statistics for **Temperature and Vector Wind** received at Bracknell from aircraft during the month for the area 40°N - 70°N, 60°W - 0°W.

Table 10 - 13 show quality statistics **(Geopotential Height and Windspeed at 100 and 500 hPa)** for all TEMPSHIPS in the area bounded by 0°N - 90°N, 100°W - 40°E and selected TEMP stations within the same area.

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Revisions

1. May 95 Monitoring statistics for NOAA-11 removed. Figures 25-27 now show data for NOAA-12
2. May 95 Notes giving details of observations included in wind direction statistics clarified and corrected.
3. August 95 Monitoring statistics for NOAA-14 added with figures 28-30.
4. February 96 Monitoring statistics for GOES-7 have been replaced by statistics for GOES-8 and GOES-9.
5. February 97 Monitoring statistics for Meteosat 5 have been replaced by statistics for Meteosat 6.
6. Sept 97 Monitoring statistics for NOAA-12 removed. Figures 25-27 now show data for NOAA-11
7. January 1998. Increase in resolution of UKMO global forecast model.
8. April 1998. GOES winds ceased on 2nd March 1998, and were replaced with GOES high resolution winds from 15th.

TABLE 1

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SHIPS, FIXED BUOYS AND PLATFORMS
MONITORING CENTRE: BRACKNELL
MONTH: June 1998

Monitoring procedures

Period	:One calendar month.
Data monitored	:Reports from each unique identifier for ships, fixed buoys and platforms.
Standard of comparison	:Background field from Bracknell global model.
Observation times	:00, 06, 12, 18 UTC
Elements monitored	:Mean sea level pressure (hPa). :Wind speed (m s^{-1}). :Wind direction (Degrees).

Parameters monitored

:NOBS	:Number of observations received excluding duplicates.
:NGE	:Number of observations with gross errors.
:PGE	:Percentage of observations with gross errors.
:SD	:SD of difference of observations from background values excluding those with gross errors.
:BIAS	:Mean difference of observations from background values excluding those with gross errors. **N.B. a positive bias indicates the observation is veered to the background.**
:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors.

GROSS ERROR LIMIT :15 hPa (pressure)
:25 m s^{-1} (vector wind)

SELECTION CRITERIA	:NOBS	≥ 20 , and one or more of the following:	
	1.| bias|	≥ 4 hPa	(pressure),
		≥ 5 m s^{-1}	(wind speed),
		≥ 30 degrees	(direction).
	2.SD	≥ 6 hPa	(pressure),
		≥ 80 degrees	(direction).
	3.PGE	≥ 25	

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE									
CTHI	ALL	P	SUR	28	8	29	1.8	-2.4	3.0
C6HQ06	ALL	P	SUR	45	1	2	1.1	-5.6	5.7
C6IL3	ALL	P	SUR	23	1	4	2.1	5.5	5.9
ELUB5	ALL	P	SUR	102	9	9	5.4	5.9	8.0
FARIS	ALL	P	SUR	77	14	18	5.6	-4.5	7.2
MVQN8	ALL	P	SUR	31	1	3	1.9	-4.1	4.5
OXPW	ALL	P	SUR	56	0	0	3.9	-7.7	8.7
PCEX	ALL	P	SUR	38	0	0	4.6	4.6	6.5
PJKP	ALL	P	SUR	59	2	3	2.6	-4.2	4.9
UAMS	ALL	P	SUR	32	4	13	2.6	-4.5	5.2
UCJR	ALL	P	SUR	43	0	0	1.6	4.4	4.7
UCUF	ALL	P	SUR	41	2	5	2.9	6.4	7.0
VCPK	ALL	P	SUR	28	11	39	5.2	-2.4	5.7
VGKM	ALL	P	SUR	23	8	35	4.1	-4.9	6.4
VGMV	ALL	P	SUR	20	11	55	3.7	-10.3	11.0
VRUS7	ALL	P	SUR	22	0	0	0.8	7.6	7.7
V2XO	ALL	P	SUR	43	0	0	1.5	-7.1	7.2
V7AW8	ALL	P	SUR	30	0	0	0.9	4.0	4.1
WCV7620	ALL	P	SUR	28	0	0	1.7	5.0	5.3
WDZB	ALL	P	SUR	34	0	0	0.8	-5.3	5.4
WFLH	ALL	P	SUR	25	0	0	0.6	-4.0	4.0
XLW363	ALL	P	SUR	35	0	0	0.9	4.4	4.5
23066	ALL	P	SUR	29	0	0	0.9	-5.8	5.8
WIND SPEED									
DVPV	ALL	SPEED	SUR	31	0	0	2.4	6.4	6.8
ELND4	ALL	SPEED	SUR	23	0	0	4.1	6.2	7.5
ELPG9	ALL	SPEED	SUR	54	0	0	5.2	5.0	7.2
FNTS	ALL	SPEED	SUR	43	0	0	4.5	8.1	9.3
GTHZ	ALL	SPEED	SUR	22	0	0	6.5	6.0	8.8
LADN4	ALL	SPEED	SUR	23	0	0	2.6	5.3	5.9
PJAG	ALL	SPEED	SUR	23	0	0	4.8	5.9	7.6
PJOX	ALL	SPEED	SUR	53	0	0	4.5	6.3	7.8
PPXU	ALL	SPEED	SUR	21	0	0	2.8	7.9	8.4
SYMK	ALL	SPEED	SUR	69	0	0	2.5	5.6	6.1
UBCB	ALL	SPEED	SUR	31	0	0	2.5	5.2	5.8
VLV4720	ALL	SPEED	SUR	24	0	0	1.7	-5.6	5.9
VRUU4	ALL	SPEED	SUR	31	3	10	6.9	14.4	16.0
VRVI3	ALL	SPEED	SUR	21	0	0	4.8	5.9	7.6
3EMJ6	ALL	SPEED	SUR	100	0	0	2.7	5.3	6.0
3ETH4	ALL	SPEED	SUR	20	0	0	2.5	5.1	5.7
3FTR6	ALL	SPEED	SUR	35	0	0	3.4	5.6	6.6
WIND DIRECTION									
C6MS4	ALL	DIRN.	SUR	20	0	0	41.6	-30.8	51.7
C6MY6	ALL	DIRN.	SUR	23	0	0	16.9	-38.8	42.3
C60T6	ALL	DIRN.	SUR	35	0	0	62.2	91.5	110.6
JBLV	ALL	DIRN.	SUR	39	0	0	69.3	-31.0	75.9
KBGK	ALL	DIRN.	SUR	20	0	0	51.4	-30.6	59.8
SYMK	ALL	DIRN.	SUR	23	0	0	88.6	21.2	91.1
13008	ALL	DIRN.	SUR	82	0	0	11.3	33.7	35.5
4QUM	ALL	DIRN.	SUR	39	0	0	67.1	-38.0	77.1
44138	ALL	DIRN.	SUR	117	0	0	85.6	14.3	86.8
45135	ALL	DIRN.	SUR	178	0	0	18.9	76.0	78.3
51009	ALL	DIRN.	SUR	21	0	0	15.8	-32.8	36.4
62162	ALL	DIRN.	SUR	47	0	0	113.8	29.1	117.5
63104	ALL	DIRN.	SUR	74	5	7	118.8	-20.4	120.6
63113	ALL	DIRN.	SUR	65	0	0	17.4	-83.5	85.3

AVAILABILITY – SHIP/SYNOP – JUNE 1998

MAIN HOURS ONLY

10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS

GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS = 20838

FIGURE 1

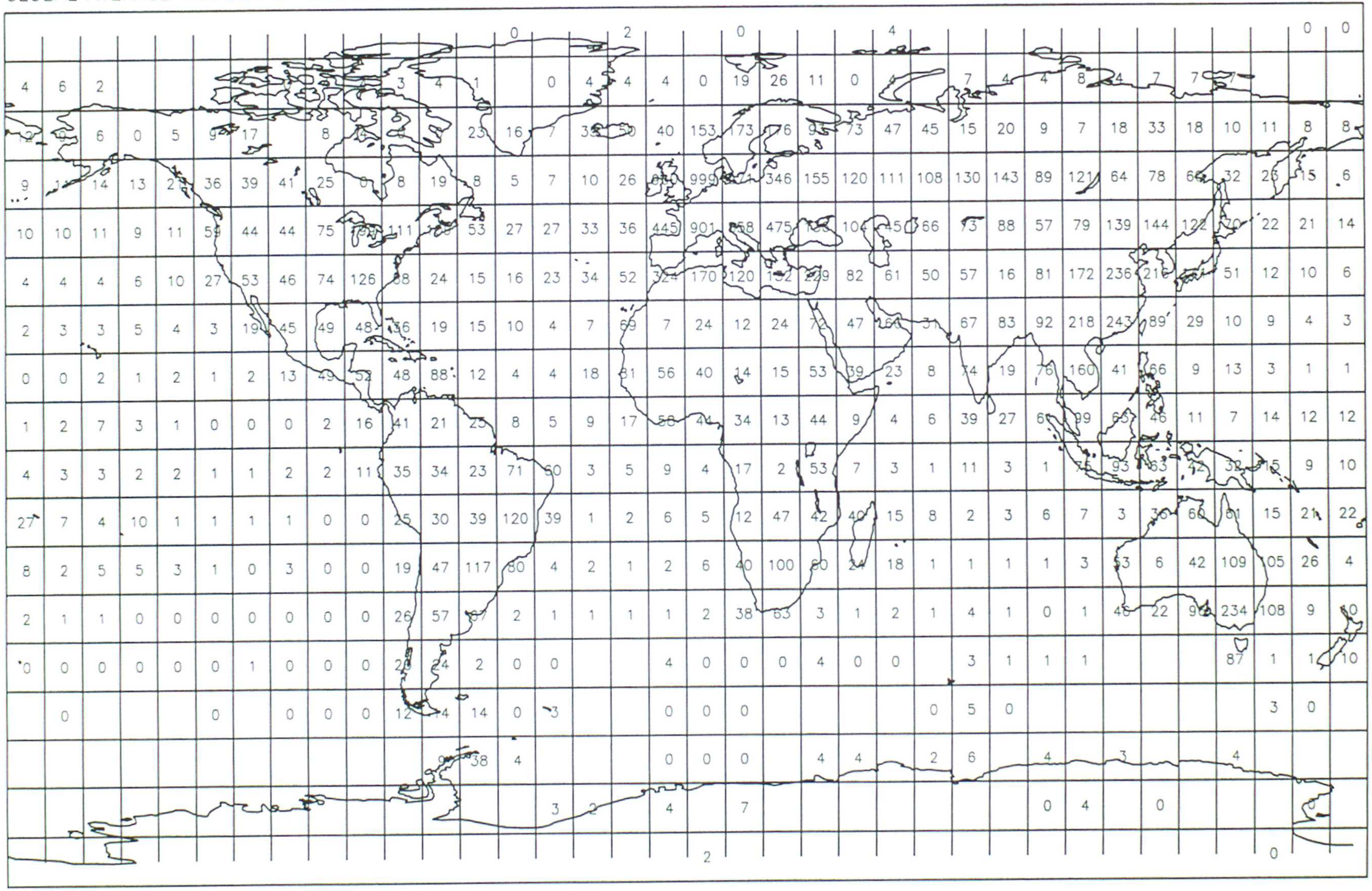


TABLE 2

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - DRIFTING BUOYS
MONITORING CENTRE: BRACKNELL
MONTH: June 1998

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for drifting buoys.

Standard of comparison :Background field from Bracknell global model.

Position :Average latitude and longitude for period.

Observation times :00, 06, 12, 18 UTC

Elements monitored :Mean sea level pressure (hPa).
:Wind speed (m s^{-1}).
:Wind direction (degrees).

Parameters monitored

:NOBS :Number of observations received excluding duplicates.

:NGE :Number of observations with gross errors.

:PGE :Percentage of observations with gross errors.

:SD :SD of difference of observations from background values excluding those with gross errors.

:BIAS :Mean difference of observations from background values excluding those with gross errors.
N.B. a positive bias indicates the observation is veered to the background.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors.

GROSS ERROR LIMIT :15 hPa (pressure)
:25 m s^{-1} (vector wind)

SELECTION CRITERIA : NOBS $\geq$ 20 , and one or more of the following:

1.| bias| $\geq$ 4 hPa (pressure),
$\geq$ 5 m s^{-1} (wind speed),
$\geq$ 30 degrees (direction).

2.SD $\geq$ 6 hPa (pressure),
$\geq$ 80 degrees (direction).
3.PGE $\geq$ 25.

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE											
17511	-36.4	76.1	ALL	P	SUR	183	0	0	4.6	-7.3	8.7
47601	78.5	-123.9	ALL	P	SUR	219	0	0	3.4	4.6	5.8
54919	-28.1	-103.0	ALL	P	SUR	192	4	2	4.5	-4.9	6.7
54920	-31.3	-94.5	ALL	P	SUR	182	178	98	1.7	-12.1	12.2
54928	-39.3	-99.5	ALL	P	SUR	131	22	17	1.2	-11.4	11.5
WIND SPEED											
52657	26.4	127.8	ALL	SPEED	SUR	50	0	0	2.2	-8.0	8.3
91874	8.7	172.2	ALL	SPEED	SUR	74	0	0	1.1	-5.3	5.4
91877	6.1	172.1	ALL	SPEED	SUR	41	0	0	0.7	-6.8	6.9
WIND DIRECTION											
52534	10.1	125.7	ALL	DIRN.	SUR	131	0	0	41.2	-45.7	61.6
52540	13.4	144.7	ALL	DIRN.	SUR	106	0	0	14.9	57.4	59.3
52624	-14.5	138.8	ALL	DIRN.	SUR	146	0	0	21.9	41.0	46.5
52657	26.4	127.8	ALL	DIRN.	SUR	138	0	0	119.8	52.9	131.0

AVAILABILITY – DRIFTER – JUNE 1998

MAIN HOURS ONLY

10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS

GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS = 5589

FIGURE 2

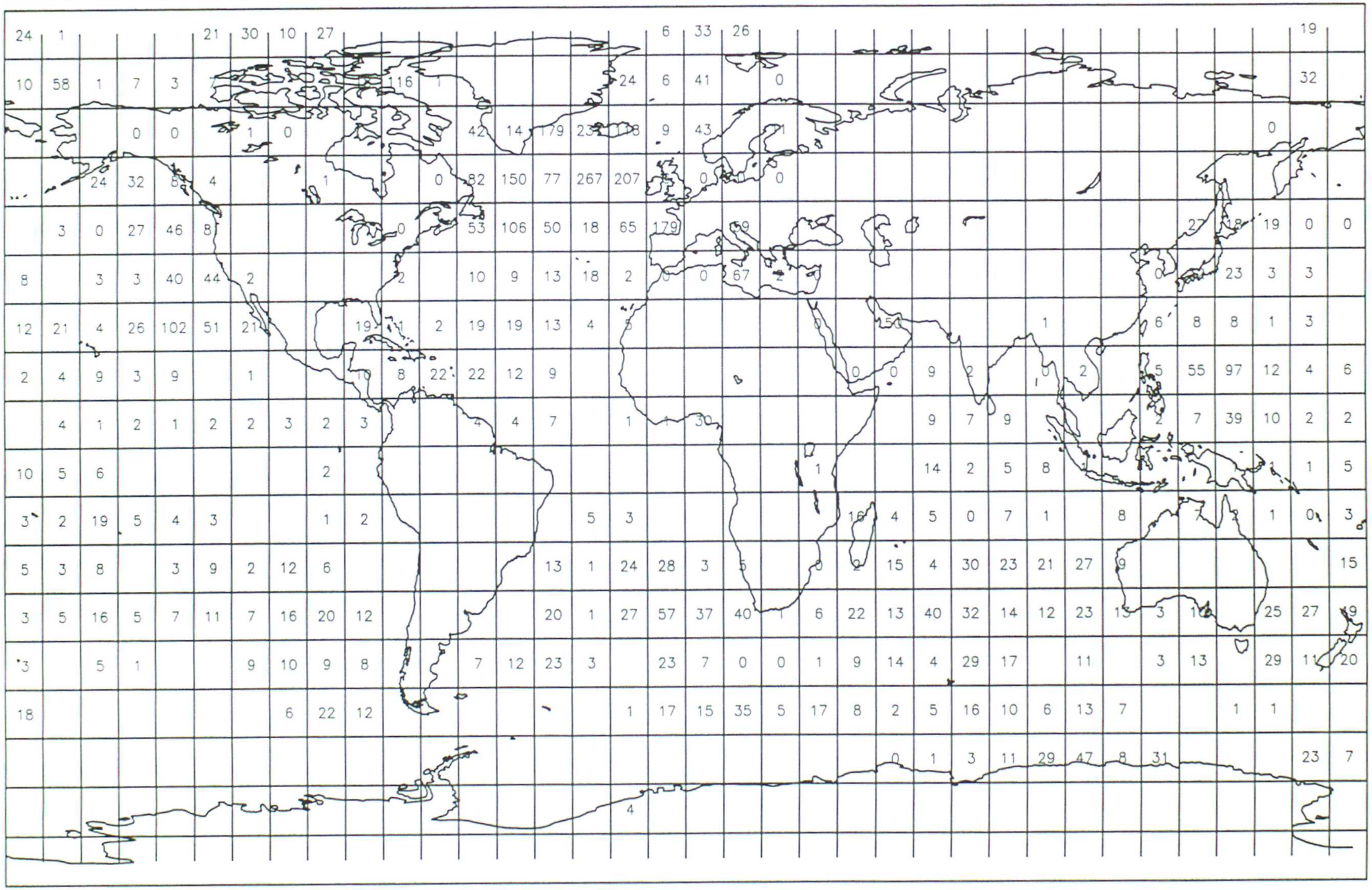

24 1 21 30 10 27 6 33 26 19
10 58 1 7 3 7 116 1 24 6 41 0 32
0 0 1 0 42 14 179 23 118 9 43 71 0
24 32 8 4 1 0 82 150 77 267 207 0 0
3 0 27 46 8 0 53 106 50 18 65 179 59 27 8 19 0 0
8 3 3 40 44 2 2 10 9 13 18 2 0 0 67 2 0 23 3 3
12 21 4 26 102 51 21 19 1 2 19 19 13 4 5 0 50 1 6 8 8 1 3
2 4 9 3 9 1 10 8 22 22 12 9 0 0 9 2 0 2 5 55 97 12 4 6
4 1 2 1 2 2 3 2 3 4 4 7 1 1 30 9 7 9 2 7 39 10 2 2
10 5 6 2 1 14 2 5 8 1 1 5
3 2 19 5 4 3 1 2 5 3 16 4 5 0 7 1 8 7 2 1 0 3
5 3 8 3 9 2 12 6 13 1 24 28 3 5 0 2 15 4 30 23 21 27 9 15
3 5 16 5 7 11 7 16 20 12 20 1 27 57 37 40 1 6 22 13 40 32 14 12 23 13 3 16 25 27 19
3 5 1 9 10 9 8 7 12 23 3 23 7 0 0 1 9 14 4 29 17 11 3 13 29 11 20
18 6 22 12 1 17 15 35 5 17 8 2 5 16 10 6 13 7 1 1
0 1 3 11 29 47 8 31 23 7
4

TABLE 3

MONITORING OF LAND SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SYNOPS & AUTOSYNOPS
MONITORING CENTRE: BRACKNELL
MONTH: June 1998

Monitoring procedures		
Period		:One calendar month.
Data monitored		:Reports from each unique identifier for synops & autosynops.
Standard of comparison		:Background field from Bracknell global model.
Observation times		:00, 06, 12, 18 UTC
Elements monitored		:Mean sea level pressure (hPa).
Parameters monitored	:HT(m)	:Station height (in metres) as given in WMO No. 9 Vol A
	:RP	:Pressure reporting practice M=mean sea level pressure (hPa) reported. S=Station level pressure reported. 8=Geopotential height (m) of 850 hPa surface reported. 7=Geopotential height (m) of 700 hPa surface reported.
	:NOBS	:Number of observations received excluding duplicates.
	:NGE	:Number of observations with gross errors.
	:PGE	:Percentage of observations with gross errors.
	:%REJ	:Percentage of observations flagged.
	:SD	:SD of difference of observations from background values excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors.
GROSS ERROR LIMIT	:15 hPa	(pressure)
SELECTION CRITERIA	:NOBS	≥ 20 ,and one or more of the following:
	1.| bias|	≥ 4 hPa
	2. SD	≥ 6 hPa
	3.PGE	≥ 25.

N.B. For stn ht ≥ 500m, mslp is that calculated from station level pressure where available.
For stn ht < 500m, mslp is that as reported by the station where available.

WMO REGION 1:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
60010	28.3N	16.5W	2367	S7	89	0	0	19	2.1	-6.5	6.8
60445	36.2N	5.4E	1081	S8	112	0	0	0	1.0	4.4	4.5
60468	35.6N	6.2E	1052	S8	106	105	99	1	0.0	13.2	13.2
60511	35.3N	1.4E	1127	S8	112	53	47	1	1.8	14.1	14.2
60535	34.7N	3.3E	1144	S8	84	0	0	1	1.1	-6.0	6.1
60571	31.6N	2.2W	773	S8	115	0	0	0	1.0	-4.4	4.5
60670	24.6N	9.5E	1054	S8	95	1	1	4	1.5	9.3	9.4
62790	12.1N	24.9E	674	MS	78	3	4	12	1.4	4.0	4.2
63330	13.5N	39.5E	2070	MS	52	51	98	0	0.0	-12.6	12.6
63333	11.1N	39.7E	1903	MS	56	0	0	16	1.0	4.1	4.2
63334	10.3N	37.7E	2515	MS	50	1	2	4	0.9	10.7	10.7
63402	7.7N	36.8E	1725	MS	77	2	3	1	1.2	8.1	8.2
63450	9.0N	38.8E	2354	MS	105	0	0	0	0.8	5.1	5.2
63471	9.6N	41.9E	1260	MS	41	0	0	0	1.0	10.1	10.1
63478	5.9N	43.6E	295	MS	24	0	0	0	1.0	7.3	7.4
68191	23.9S	31.1E	407	S8	112	0	0	51	2.2	-4.1	4.7
68343	27.6S	25.6E	1228	S8	106	0	0	101	0.9	-9.9	9.9
68396	26.5S	31.3E	641	S	52	0	0	0	1.2	4.0	4.2
68442	29.1S	26.3E	1359	S8	111	0	0	100	0.7	-4.6	4.7
68717	30.0S	19.0E	122	MS	112	0	0	52	1.9	4.0	4.4
69679	43.9N	18.3E	1557	M	52	52	100	0	0.0	0.0	0.0

WMO REGION 2:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
30320	56.9N	105.7E	669	MS	52	25	48	2	1.7	0.3	1.7
30554	54.5N	113.6E	995	MS	117	0	0	46	4.6	5.2	6.9
40743	36.2N	57.7E	941	MS	113	0	0	1	0.9	-5.1	5.2
40762	35.3N	59.2E	1333	MS	109	0	0	1	0.7	-11.9	11.9
41254	23.1N	57.7E	1755	S8	56	56	100	0	0.0	0.0	0.0
44416	28.6N	81.6E	720	MS	70	2	3	6	2.3	5.1	5.6
44477	27.0N	87.4E	1445	S8	64	64	100	0	0.0	0.0	0.0
52602	38.8N	93.4E	2734	S	118	0	0	0	0.9	-6.6	6.7
53588	39.0N	113.5E	2898	S	117	117	100	1	0.0	0.0	0.0
54587	39.1N	123.2E	126	M	111	1	1	5	2.4	-4.3	4.9
56021	34.1N	95.8E	4176	S	118	0	0	0	0.8	-4.0	4.1
56144	31.8N	98.6E	3184	S	68	0	0	0	1.2	-4.2	4.4
56385	29.5N	103.3E	3049	S	118	0	0	0	1.2	-5.0	5.1
56444	28.5N	98.9E	3488	S	101	49	49	12	0.6	13.3	13.3
56462	29.0N	101.5E	2994	S	106	0	0	1	1.1	8.1	8.2
56954	22.6N	99.9E	1054	M	118	0	0	8	1.2	4.0	4.2

WMO REGION 3:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
80099	7.1N	70.7W	128	MS	32	0	0	0	1.2	-5.2	5.3
82704	7.6S	72.7W	170	MS	80	1	1	1	1.7	-5.0	5.3
83214	10.3S	54.9W	285	MS	70	1	1	1	1.0	-7.6	7.7
83235	12.4S	46.4W	604	MS	84	0	0	1	1.2	6.0	6.1
83319	14.7S	52.4W	315	M	61	0	0	2	1.6	-5.5	5.7
83332	14.1S	46.4W	826	MS	86	5	6	2	1.1	13.0	13.0
83408	14.3S	43.8W	447	MS	84	2	2	1	1.1	9.6	9.7
83423	16.7S	49.3W	741	MS	82	0	0	0	1.0	-6.1	6.2
83488	17.8S	42.9W	1097	MS	86	86	100	1	0.0	0.0	0.0
83531	18.6S	46.5W	940	MS	73	0	0	1	1.1	-7.5	7.6
83587	19.9S	43.9W	850	MS	86	0	0	0	1.1	-6.9	7.0
83704	22.3S	53.9W	369	MS	63	20	32	32	1.7	-9.8	9.9
83773	23.1S	48.9W	793	S	42	0	0	0	1.2	-6.8	6.9
84401	5.2S	80.6W	49	MS	83	0	0	0	1.1	5.4	5.5
84455	6.5S	76.4W	281	MS	61	0	0	2	1.6	5.6	5.8

WMO REGION 3:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
84472	7.1S	78.5W	2620	S	42	0	0	0	0.9	-5.6	5.7
84686	13.6S	72.0W	3248	S	102	0	0	0	1.1	-5.4	5.5
84782	18.1S	70.3W	468	MS	86	0	0	2	1.6	7.7	7.9
85406	18.3S	70.3W	55	M	117	0	0	1	2.0	4.7	5.1

WMO REGION 4:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
76118	30.4N	109.7W	1040	S	20	0	0	0	0.5	-9.3	9.3
76551	21.5N	106.6W	4	MS	50	0	0	72	2.1	-5.9	6.3
76625	20.6N	100.4W	1813	MS	37	0	0	8	1.4	-7.3	7.4
76632	20.1N	98.7W	2417	MS	29	0	0	0	0.5	-5.2	5.2
76698	19.6N	88.0W	20	MS	66	0	0	2	1.3	-5.7	5.8
76762	17.5N	99.5W	1865	MS	36	36	100	0	0.0	0.0	0.0
76775	17.1N	96.7W	1550	S	26	0	0	0	1.0	4.3	4.4
76845	16.7N	92.6W	2276	MS	70	70	100	1	0.0	0.0	0.0
78718	14.4N	87.6W	626	MS	30	21	70	43	0.5	-14.4	14.4

WMO REGION 5:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
94328	22.4S	133.6E	623	MS	64	0	0	0	0.8	6.5	6.5
94955	41.6S	145.7E	684	MS	112	112	100	1	0.0	0.0	0.0
95952	41.9S	145.6E	560	MS	108	108	100	1	0.0	0.0	0.0

WMO REGION 6:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
02045	67.8N	20.4E	408	M	104	104	100	1	0.0	0.0	0.0
03305	53.1N	3.9W	216	M	346	117	34	1	0.7	0.1	0.7
04416	72.6N	38.4W	3202	S7	77	6	8	3	1.2	-4.2	4.4
16227	41.9N	13.6E	655	MS	204	202	99	0	0.0	-14.5	14.5
16614	40.4N	21.3E	604	MS	93	0	0	0	1.1	-6.6	6.7
17092	39.8N	39.5E	1218	S8	110	1	1	50	1.4	6.3	6.5

ANTARCTIC:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
89004	71.7S	2.8W	815	M	323	5	2	1	3.2	-6.8	7.5
89108	89.0S	0.3W	2754	S	263	3	1	1	4.1	5.6	6.9
89272	75.0S	70.8W	1395	S	254	0	0	1	2.7	4.0	4.8
89345	89.7S	148.8W	620	S	347	84	24	1	3.0	-9.4	9.9

TABLE 4

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: June 1998

Monitoring procedures

Period :One calendar month.

Data monitored :Statistics for each airline carrier.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from Bracknell global model.

Observation times :All hours combined.

Level(s) monitored :70.0 - 500.0 hPa

Elements monitored :TEMP in °C ; WIND in m s^{-1}

Parameters monitored

:N REP. :Number of observations received excluding duplicates.

:PG :Percentage of observations with gross errors.

:PR :Percentage of observations rejected by quality control including rejections from the duplicate check.

:PC :Percentage of observations with calm winds.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.

:BIAS :Mean difference of observations from background values excluding those with gross errors in Temperature & Wind Speed.

GROSS ERROR LIMITS :10.0 °C ; 60 m s^{-1} Vector Wind

SELECTION CRITERIA :N REP $\geq$ 20

NB: US ACARs and ADS data are shown at the bottom of the table as US ACAR and ADS respectively.

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAA	100	2	16	2.4	1.1	99	0	10	0	7.3	0.6
AAH	79	3	34	2.5	1.7	75	0	35	0	13.3	2.5
AAL	6568	1	29	1.7	-0.1	5548	0	23	0	7.6	1.0
AAR	1342	0	8	1.7	-0.6	1308	0	10	0	8.6	0.5
ACA	2446	1	10	1.9	-0.1	2215	0	6	0	6.7	0.4
ACI	87	0	41	1.4	0.6	86	1	44	0	11.0	0.3
AEA	589	1	27	2.3	0.8	504	0	21	0	8.7	0.1
AEL	540	1	16	1.7	-0.7	551	0	16	0	8.0	0.5
AEY	124	0	5	1.8	0.8	120	0	4	0	7.0	0.7
AFL	443	1	12	2.0	0.4	396	1	8	0	8.1	0.7
AFR	1429	1	13	1.6	0.1	1339	0	13	0	7.7	0.9
AIH	240	3	10	1.9	0.1	189	1	5	0	7.2	0.9
AJM	50	2	8	1.9	-0.5	40	0	8	0	8.4	1.0
AMT	1163	1	67	1.4	0.5	1146	0	46	1	7.2	1.3
AMX	302	1	5	1.7	0.1	300	0	4	0	8.1	1.0
ANA	1111	1	8	1.5	-0.1	1085	0	8	0	8.1	0.6
ANZ	3806	2	39	1.8	0.0	3742	0	38	0	9.1	0.8
AOM	770	1	9	1.8	1.0	719	0	8	0	8.3	0.9
ASY	26	0	35	1.5	-0.6	25	0	40	0	8.7	1.5
AUA	40	0	30	2.2	-0.5	29	0	17	0	5.2	1.1
AVA	472	1	4	1.5	0.1	470	0	6	0	8.5	0.3
AVN	91	1	3	1.9	0.1	91	0	7	0	13.3	0.1
AXA	117	1	34	1.8	0.4	115	0	34	0	9.7	-0.3
AZA	435	2	23	2.1	0.0	333	0	17	0	9.3	0.8
BAL	977	1	16	1.6	-0.5	953	0	16	0	7.7	0.5
BAW	1730	0	21	2.0	-0.2	1476	0	16	0	7.3	0.9
BBB	72	3	6	1.7	-0.6	59	0	41	0	11.3	-0.5
BWA	400	1	18	1.9	0.4	342	0	12	0	7.4	0.9
CAL	2086	1	7	1.5	-0.2	2074	0	8	0	8.4	0.3
CCA	265	2	10	2.1	0.7	276	0	53	1	10.5	-0.3
CDN	2600	0	11	1.7	0.2	2478	0	9	0	7.7	0.4
CES	393	0	8	1.6	0.2	393	1	11	0	9.1	0.6
CFC	32	0	19	2.2	0.4	32	0	22	0	8.9	4.4
CFG	1113	1	7	1.8	-0.9	1051	0	4	0	7.8	0.6
CKS	504	1	40	1.6	0.8	480	0	41	1	7.8	0.9
CKT	183	1	19	1.5	0.5	154	1	12	0	7.4	0.6
CLX	365	0	7	2.1	-0.7	349	0	4	0	7.0	0.2
CMI	560	1	7	1.6	0.5	539	0	6	0	7.7	1.1
CMM	570	1	13	1.6	0.1	517	0	9	0	7.0	0.6
COA	1909	0	35	1.6	0.2	1672	0	32	1	9.9	1.2
CPA	92	1	11	2.0	0.0	93	2	10	0	7.3	-0.3
CRL	561	1	10	1.7	0.7	523	0	9	0	7.1	0.3
CSN	85	0	8	1.7	0.4	88	1	10	0	7.0	1.2
CTB	335	0	5	1.9	-0.4	333	0	5	0	7.0	0.8
CTM	81	0	21	1.7	-0.2	81	0	23	0	8.3	1.6
CUB	484	1	9	2.4	1.1	462	0	57	0	10.0	1.4
DAL	6439	1	35	2.0	0.2	5417	0	29	0	7.3	0.7
DBY	430	1	3	1.6	-0.9	423	0	5	0	9.5	0.4
DHL	208	6	68	5.1	-2.9	153	0	21	0	10.3	1.5
DLH	3193	1	16	2.0	-0.1	2806	0	11	0	7.3	0.8
EIA	407	0	35	1.2	0.0	393	0	35	1	8.4	1.1
EIN	38	0	0	2.1	0.5	40	0	3	0	7.7	0.6
ELY	143	1	14	1.5	-0.2	132	0	8	0	8.0	1.6
EVA	2381	0	7	1.5	-0.4	2375	0	7	0	8.0	0.3
EWW	112	1	21	2.8	0.7	101	0	100	1	12.3	2.1
FDX	1134	1	21	1.5	0.4	1082	0	19	0	7.4	0.9
FIN	636	1	24	2.0	0.2	486	0	12	0	5.7	0.3
FJI	850	3	42	1.7	0.2	821	1	40	0	9.7	0.5
FOM	179	2	43	2.0	0.1	177	0	41	1	11.5	-0.3

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
GAF	173	0	32	2.3	-0.2	120	0	15	0	6.4	1.1
GCO	116	3	33	1.4	1.0	111	0	65	0	9.2	0.4
GHA	75	4	4	1.3	0.4	46	0	7	0	10.9	3.4
GIA	69	3	30	1.8	1.1	68	0	28	0	8.6	1.3
GRL	26	0	0	1.4	0.3	26	0	0	0	5.1	-1.5
GTI	29	3	24	2.6	0.4	30	0	17	0	7.7	-0.8
HAL	3076	0	39	1.3	0.2	2984	0	40	1	7.7	1.3
HLF	111	3	23	1.4	-0.6	95	0	12	0	5.4	0.6
HRH	164	9	66	1.9	1.1	148	2	82	3	9.0	-0.9
IBE	2710	2	24	2.2	0.7	2341	0	17	0	8.6	0.4
ICE	855	1	29	1.9	0.1	624	0	18	0	6.7	0.8
IRL	37	0	27	2.2	1.2	28	0	11	0	4.9	0.6
JAL	6667	0	6	1.6	0.2	6534	0	6	0	7.9	0.9
JKK	309	0	30	2.0	0.0	234	0	21	0	8.7	1.1
KAL	3522	1	8	1.5	-0.3	3477	0	9	0	8.1	0.7
KIW	34	6	59	2.6	1.9	34	0	53	0	7.2	1.9
KLM	3452	0	23	1.7	0.0	3203	0	21	0	7.5	0.9
LAN	30	7	27	3.5	1.5	29	0	17	0	10.6	0.8
LAP	45	7	47	5.2	-3.9	45	4	100	0	28.8	15.9
LDA	225	0	22	1.8	-1.2	201	0	18	0	7.6	0.1
LDI	352	0	26	1.6	-0.7	313	0	19	0	7.8	0.3
LEI	208	0	13	2.0	0.3	191	0	8	0	7.3	0.8
LIB	362	1	4	1.7	0.9	355	0	4	0	7.0	0.6
LOT	181	1	27	2.4	-1.2	134	0	16	0	8.4	2.1
LTU	977	0	23	1.8	-0.3	811	0	15	0	6.9	0.7
LXR	34	0	18	1.5	1.0	28	0	21	0	8.0	0.7
MAH	25	0	8	1.8	-0.9	25	0	8	0	6.9	1.6
MAS	413	0	10	1.6	-0.2	406	0	11	0	9.1	0.4
MAU	21	0	10	1.6	0.9	21	0	14	0	14.3	-1.2
MDA	151	0	1	1.5	0.1	150	1	5	0	9.5	0.1
MON	146	1	16	1.5	0.1	131	0	11	0	6.2	1.0
MPD	214	1	14	2.2	1.0	193	0	7	0	7.2	0.3
MPH	1056	0	8	1.9	-0.7	996	0	6	0	7.0	0.5
NCA	555	0	3	1.4	0.1	550	0	4	0	9.1	0.5
NWA	11472	1	13	1.8	0.5	10938	0	12	0	7.8	0.6
PAC	213	0	23	1.7	0.0	195	1	22	2	8.5	1.3
PAL	407	1	14	1.5	-0.5	392	0	14	0	8.0	0.8
PAO	399	1	54	1.5	0.0	397	0	55	0	9.5	0.5
QFA	1732	1	31	1.7	-0.1	1717	0	30	0	8.7	0.7
RAF	144	3	10	1.8	0.7	143	1	10	0	12.2	2.2
RAM	81	2	11	2.1	-0.6	80	0	44	0	8.9	1.4
RCH	521	2	25	2.7	0.7	457	0	22	1	10.6	2.0
RKA	170	0	3	1.6	0.0	93	0	8	0	10.9	3.2
ROY	315	2	20	2.2	-0.5	268	0	10	0	8.2	1.3
RRR	227	1	17	1.9	0.1	216	0	16	0	7.9	0.7
RYN	225	0	45	1.2	0.3	221	0	46	2	6.8	1.3
SAA	303	1	3	1.9	0.1	287	0	4	0	8.0	0.7
SAB	75	0	19	1.9	0.1	62	0	11	0	7.2	2.8
SAS	1306	0	1	1.8	-0.2	1308	0	3	0	6.9	0.2
SCX	36	0	47	1.0	0.1	29	0	55	0	5.3	1.3
SIA	1299	1	6	1.5	-0.6	1277	0	6	0	8.0	0.2
SLR	135	0	15	1.4	-0.6	134	0	17	0	7.2	-0.2
SOL	86	5	22	1.1	0.3	84	0	20	0	8.4	0.0
SVA	79	1	8	1.8	-0.5	93	0	5	0	7.2	-0.2
SVV	23	0	0	1.9	-1.2	23	0	17	0	16.1	7.6
SWR	177	0	27	1.9	0.5	140	0	14	0	7.7	1.4
TAP	743	1	5	1.5	-0.5	729	0	6	0	9.0	1.0
TBA	60	7	28	2.9	0.3	54	0	30	0	16.4	1.6
THA	539	0	9	1.4	-0.4	538	1	12	0	9.3	0.5

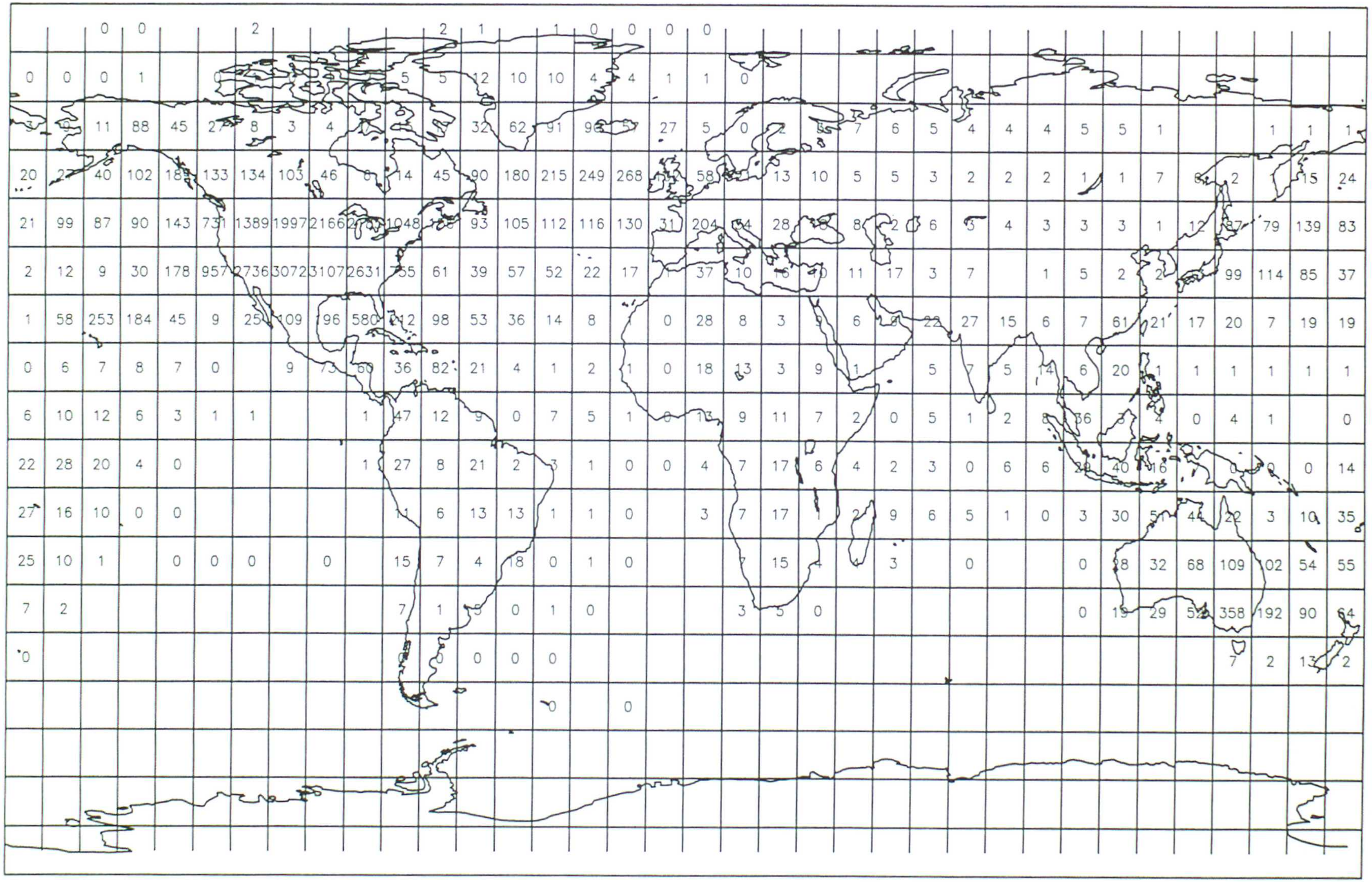
	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
TOW	134	4	31	2.8	0.4	103	0	18	0	8.9	2.3
TPA	34	0	6	0.7	0.0	32	0	3	0	7.5	-0.2
TSC	161	1	20	2.3	0.5	133	0	11	0	7.6	1.7
TWA	1921	1	34	2.0	-0.1	1467	0	24	0	8.4	0.9
UAL	108785	1	88	1.4	-0.1	108289	0	88	1	6.5	0.5
UPS	1212	1	36	1.5	0.1	1146	0	35	1	7.4	0.6
USA	385	3	35	1.9	-0.3	270	0	23	0	7.1	1.2
VIR	354	1	11	1.9	-0.4	323	0	6	0	6.6	1.7
VKG	67	0	6	1.9	0.3	65	0	5	0	8.2	2.2
VRG	268	1	33	2.5	0.9	257	0	100	0	13.7	1.1
VSP	216	1	20	2.0	0.2	205	0	21	0	9.8	1.5
VVR	23	0	39	3.4	0.9	24	4	33	0	5.4	1.9
WOA	138	1	19	2.2	0.3	135	0	16	2	7.2	1.1
AN	19920	0	1	1.5	0.1	19920	0	0	0	6.7	1.0
BA	19959	0	0	1.5	0.6	19897	0	11	0	6.5	0.7
GU	35	0	31	0.9	0.0	28	0	32	0	7.3	0.3
IT	371	0	47	1.1	0.5	371	0	47	0	6.7	0.0
KL	11034	3	19	1.5	0.9	11029	0	30	0	8.4	1.0
LH	3379	0	0	1.7	0.8	3493	0	1	0	6.8	0.8
MK	2493	0	0	2.0	1.5	2479	0	1	0	8.0	1.0
OZ	50	2	50	2.0	-0.1	49	0	51	8	12.8	1.2
QF	15191	0	1	1.3	0.5	15188	0	1	0	6.5	0.7
SA	3994	0	30	1.7	1.0	3993	0	23	0	7.4	0.9
SV	1053	20	21	2.2	1.7	1048	0	8	0	10.2	1.4
UA	4146	1	34	1.5	0.1	4382	0	32	0	8.5	1.1
WA	818	8	11	1.9	0.6	810	5	100	1	14.7	-2.8
XX	3000	1	3	1.5	0.5	3561	0	100	1	13.5	1.6
N	780	2	23	2.5	0.6	700	0	21	1	8.9	0.8
ADS	240	0	1	1.4	0.0	240	0	1	0	5.1	1.1
US ACARS	510373	0	8	1.3	0.2	510357	0	10	0	6.5	0.7

MEAN DAILY COUNT OF AIRCRAFT   70 -   500 HPA

JUNE 1998

OBSERVATIONS WITH O-B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED

FIGURE 3


0 0 2 2 1 1 0 0 0 0
0 0 0 1 0 5 5 12 10 10 4 4 1 1 0
3 9 11 88 45 27 8 3 4 32 62 91 96 57 27 5 0 2 7 6 5 4 4 4 5 5 1 1 1 1
20 27 40 102 18 133 134 103 46 0 14 45 90 180 215 249 268 58 13 10 5 5 3 2 2 2 1 1 7 8 2 15 24
21 99 87 90 143 731 1389 1997 2166 1048 93 105 112 116 130 31 204 54 28 8 2 6 3 4 3 3 3 1 12 87 79 139 83
2 12 9 30 178 957 2736 3072 3107 2631 755 61 39 57 52 22 17 1 37 10 16 10 11 17 3 7 1 5 2 2 99 114 85 37
1 58 253 184 45 9 25 109 196 580 212 98 53 36 14 8 1 0 28 8 3 9 6 9 22 27 15 6 7 61 21 17 20 7 19 19
0 6 7 8 7 0 9 73 60 36 82 21 4 1 2 1 0 18 13 3 9 1 5 7 5 14 6 20 1 1 1 1 1 1
6 10 12 6 3 1 1 1 47 12 9 0 7 5 1 0 13 9 11 7 2 0 5 1 2 8 36 3 4 0 4 1 0
22 28 20 4 0 1 27 8 21 2 3 1 0 0 4 7 17 6 4 2 3 0 6 6 29 40 16 7 0 0 0 14
27 16 10 0 0 11 6 13 13 1 1 0 3 7 17 1 2 9 6 5 1 0 3 30 51 44 22 3 10 35
25 10 1 0 0 0 0 15 7 4 18 0 1 0 7 15 4 4 3 0 0 28 32 68 109 102 54 55
7 2 7 1 5 0 1 0 3 5 0 0 19 29 52 358 192 90 64
0 0 0 0 0 0 7 2 13 2
0 0

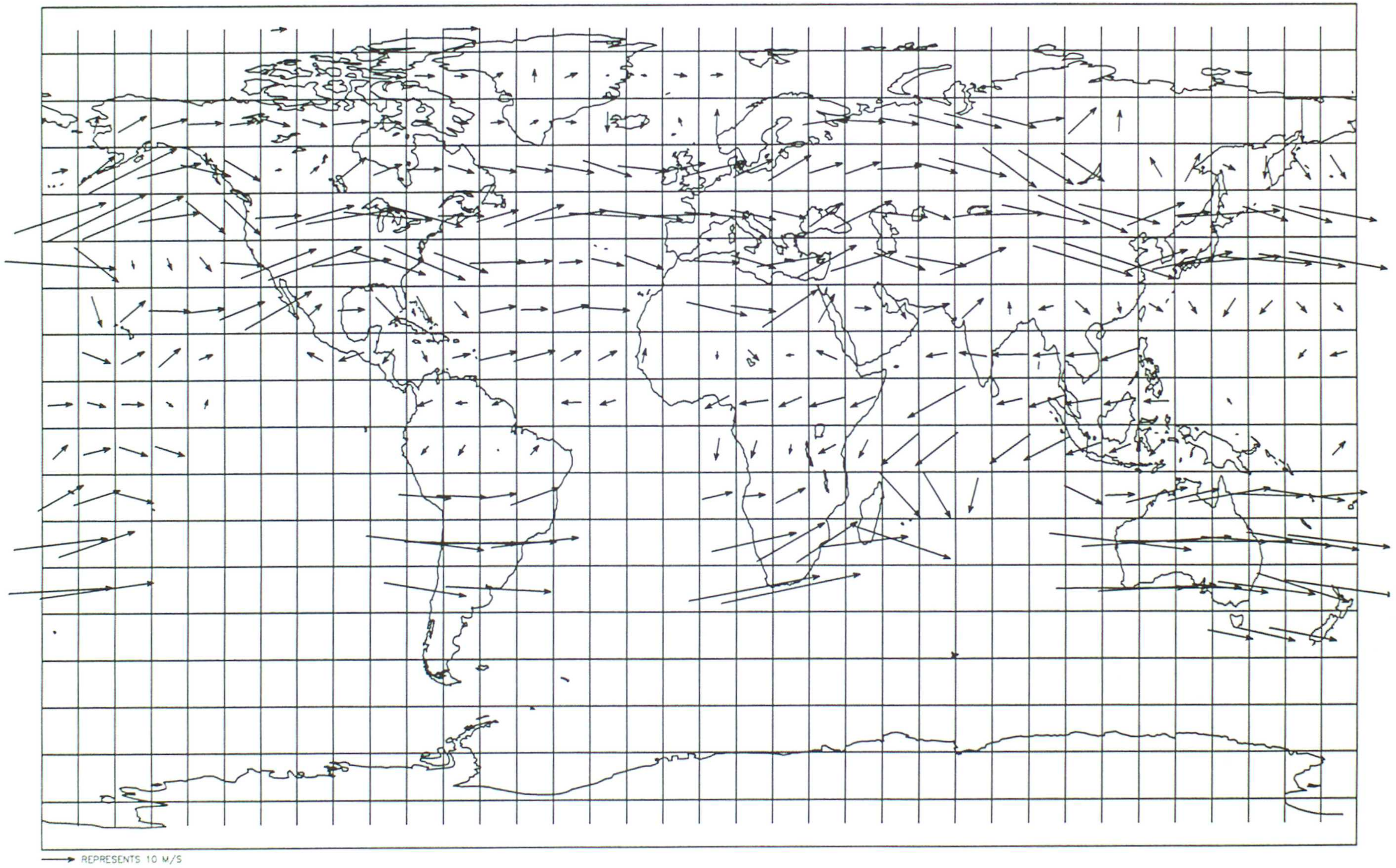
AIRCRAFT MEAN WINDS BETWEEN 70 AND 500 HPA

FIGURE 4

JUNE 1998

OBSERVATIONS WITH O-B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED

VALUES ARE PRINTED WHERE MORE THAN 30 OBS ARE PRESENT



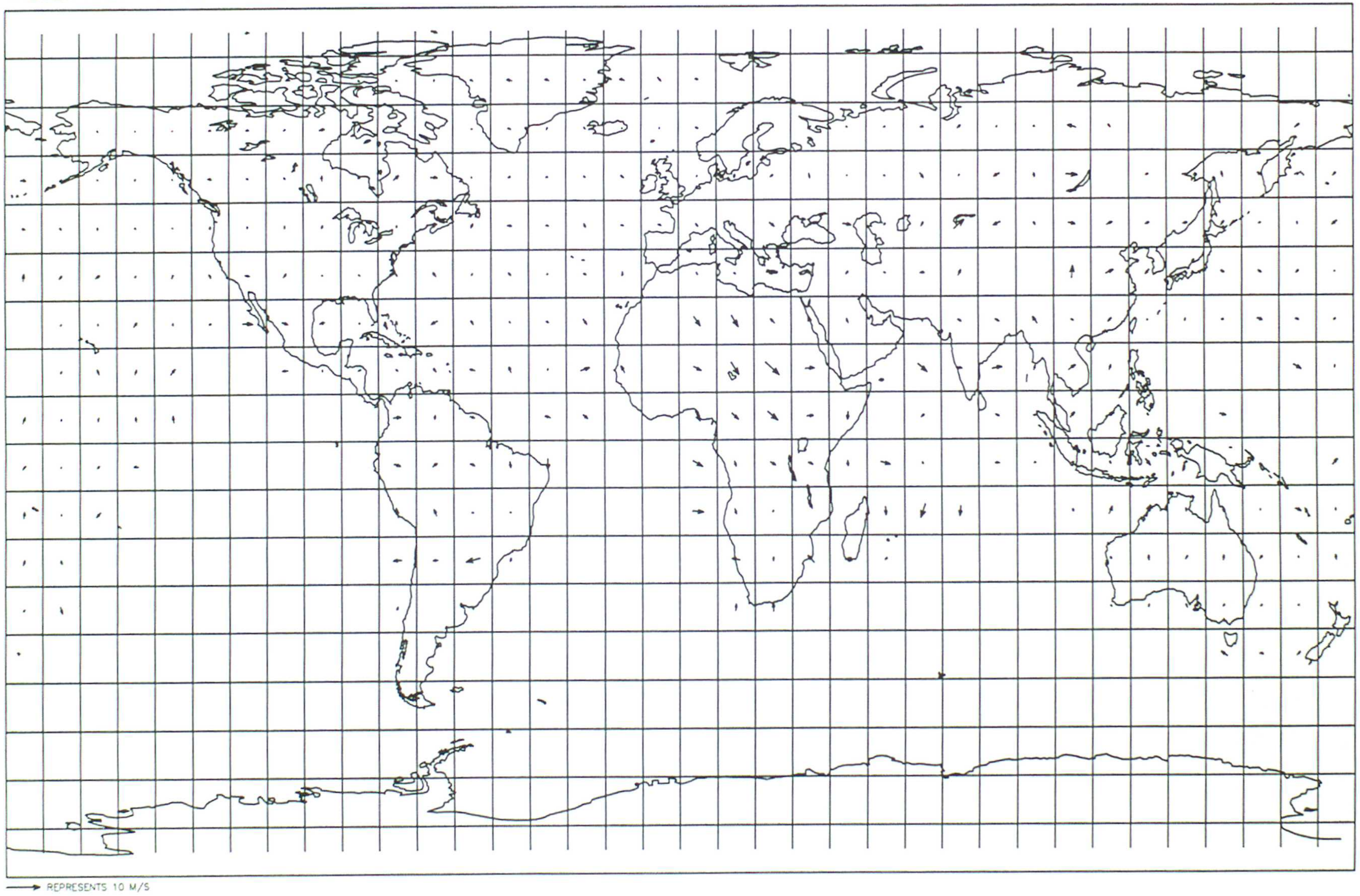
AIRCRAFT MEAN O-B WINDS BETWEEN 70 AND 500 HPA

FIGURE 5

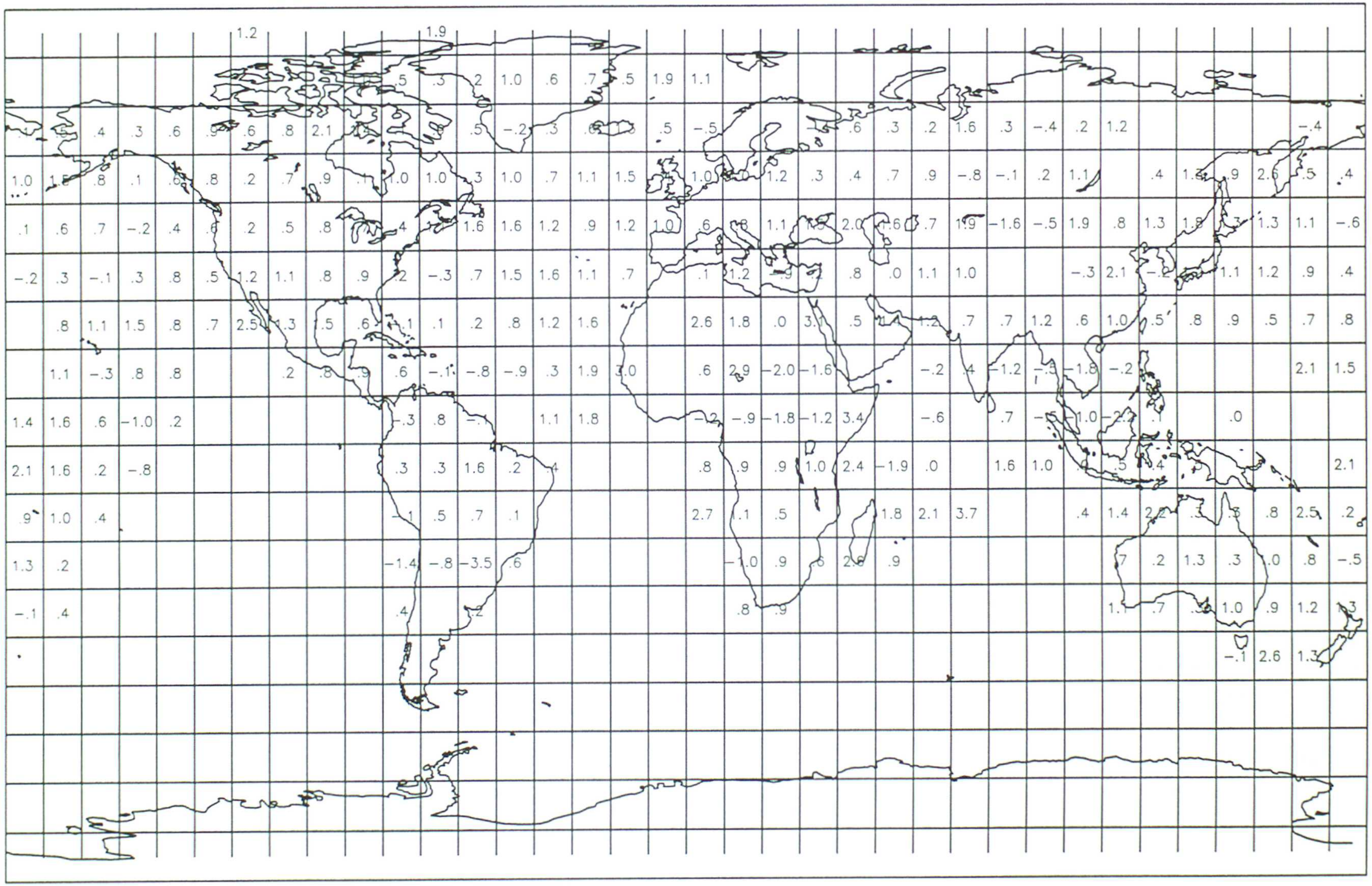
JUNE 1998

OBSERVATIONS WITH O-B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED

VALUES ARE PRINTED WHERE MORE THAN 30 OBS ARE PRESENT



AIRCRAFT : MEAN O−B SPEEDS (M/S) BETWEEN 70 AND 500 HPA FIGURE 6
JUNE 1998
OBSERVATIONS WITH O−B VECTOR DIFFERENCE > 60 MPS EXCLUDED
VALUES ARE PRINTED WHERE > 30 OBS ARE PRESENT


1.2 1.9
.5 .3 .2 1.0 .6 .7 .5 1.9 1.1
.5 .4 .3 .6 .9 .6 .8 2.1 .5 −.2 .3 .6 .5 −.5 .6 .3 .2 1.6 .3 −.4 .2 1.2 −.4
1.0 1.5 .8 .1 .6 .8 .2 .7 .9 .1 .0 1.0 .3 1.0 .7 1.1 1.5 1.0 1.2 .3 .4 .7 .9 −.8 −.1 .2 1.1 .4 1.4 .9 2.6 .5 .4
.1 .6 .7 −.2 .4 .6 .2 .5 .8 .4 1.6 1.6 1.2 .9 1.2 1.0 .6 .8 1.1 1.5 2.0 .6 .7 1.9 −1.6 −.5 1.9 .8 1.3 1.8 .3 1.3 1.1 −.6
−.2 .3 −.1 .3 .8 .5 1.2 1.1 .8 .9 .2 −.3 .7 1.5 1.6 1.1 .7 .1 1.2 .9 .2 .8 .0 1.1 1.0 −.3 2.1 −.2 1.1 1.2 .9 .4
.8 1.1 1.5 .8 .7 2.5 1.3 .5 .6 .1 .1 .2 .8 1.2 1.6 2.6 1.8 .0 3.1 .5 1.4 1.2 .7 .7 1.2 .6 1.0 .5 .8 .9 .5 .7 .8
1.1 −.3 .8 .8 .2 .8 .9 .6 −.1 −.8 −.9 .3 1.9 3.0 .6 2.9 −2.0 −1.6 −.2 .4 −1.2 −.3 −1.8 −.2 2.1 1.5
1.4 1.6 .6 −1.0 .2 −.3 .8 −.1 1.1 1.8 −.2 −.9 −1.8 −1.2 3.4 −.6 .7 −.5 −1.0 −2.2 .1 .0
2.1 1.6 .2 −.8 .3 .3 1.6 .2 .4 .8 .9 .9 1.0 2.4 −1.9 .0 1.6 1.0 .9 .5 .4 .5 2.1
.9 1.0 .4 −.1 .5 .7 .1 2.7 .1 .5 1.8 2.1 3.7 .4 1.4 2.2 .3 .3 .8 2.5 .2
1.3 .2 −1.4 −.8 −3.5 .6 −1.0 .9 .6 2.6 .9 .7 .2 1.3 .3 .0 .8 −.5
−.1 .4 .4 .2 .8 .9 1.1 .7 .3 1.0 .9 1.2 1.3
−.1 2.6 1.3

AIRCRAFT : RMS O-B VECTOR (M/S) BETWEEN 70 AND 500 HPA FIGURE 7

JUNE 1998

OBSERVATIONS WITH O-B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED

VALUES ARE PRINTED WHERE > 30 OBS ARE PRESENT

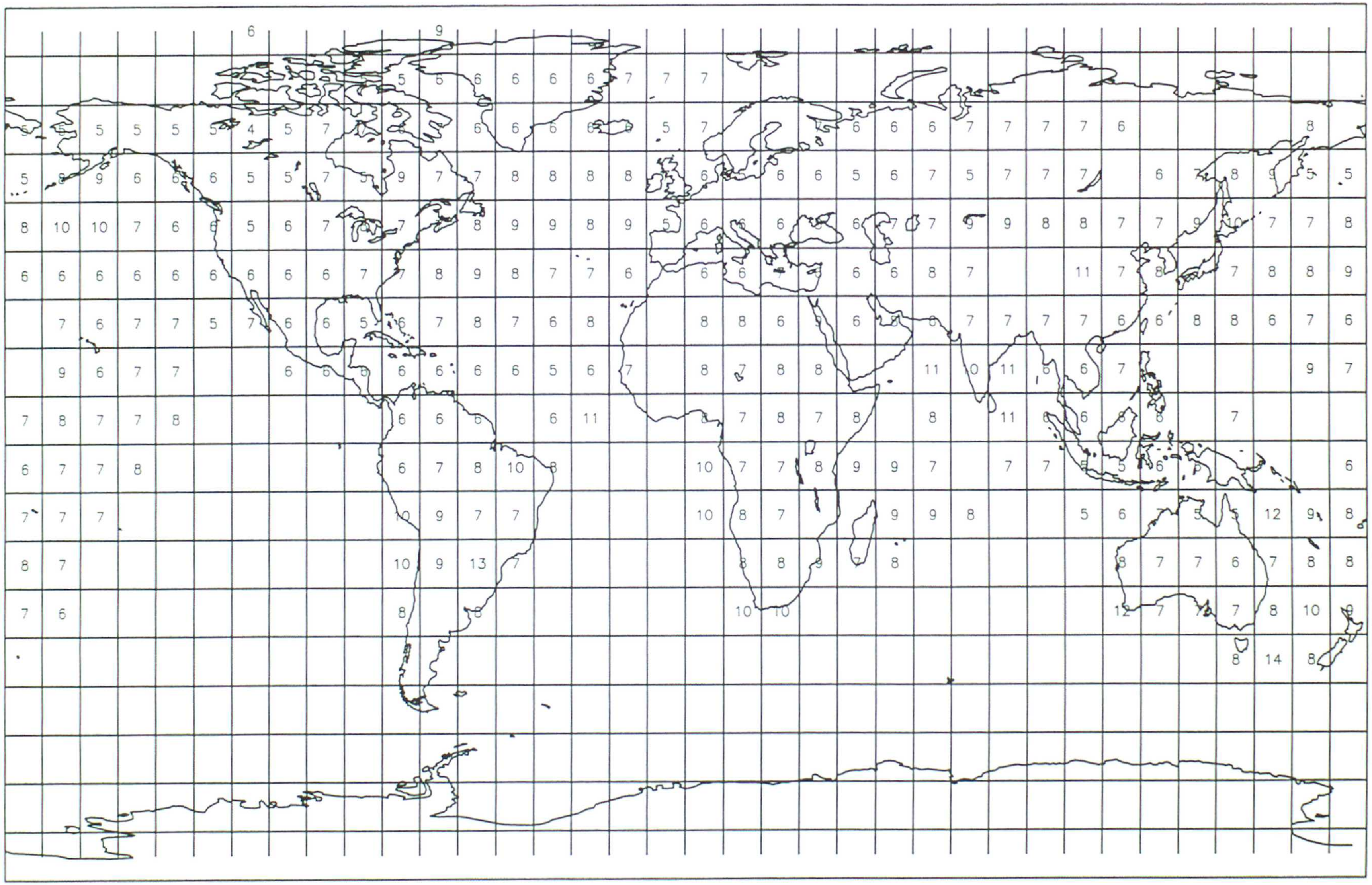

6 9
5 6 6 6 6 6 7 7 7
5 5 5 5 5 5 4 5 7 8 6 6 6 6 6 5 7 6 6 6 7 7 7 7 6 8
5 8 9 6 6 6 5 5 7 5 9 7 7 8 8 8 8 6 6 6 6 5 6 7 5 7 7 7 6 7 8 9 5 5
8 10 10 7 6 6 5 6 7 7 7 8 9 9 8 9 5 6 6 6 6 6 7 7 9 9 8 8 7 7 9 10 7 7 8
6 6 6 6 6 6 6 6 6 7 7 8 9 8 7 7 6 6 6 6 6 8 7 11 7 8 7 8 8 9
7 6 7 7 5 7 6 6 5 6 7 8 7 6 8 8 8 6 9 6 8 6 7 7 7 7 6 6 8 8 6 7 6
9 6 7 7 6 6 6 6 6 6 6 5 6 7 8 7 8 8 11 10 11 6 6 7 9 7
7 8 7 7 8 6 6 6 6 11 8 7 8 7 8 8 11 8 6 8 6 7
6 7 7 8 6 7 8 10 8 10 7 7 8 9 9 7 7 7 8 5 6 6 6
7 7 7 10 9 7 7 10 8 7 9 9 8 5 6 7 5 5 12 9 8
8 7 10 9 13 7 8 8 9 7 8 8 7 7 6 7 8 8
7 6 8 8 10 10 12 7 7 7 8 10 9
8 14 8

TABLE 5

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: June 1998

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from Bracknell global model.
Observation times		:00 UTC and 12 UTC.
Level(s) monitored		:Standard levels between 1000.0 - 30.0 hPa
Element monitored		:GEOPOTENTIAL HEIGHT IN metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown duringperiod.
	:% REJ	:Percentage of observations rejected by quality control at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.
	:NUM LEVELS	:Number of levels satisfying selection criteria.
GROSS ERROR LIMITS	:Defined in Appendix I.1	
SELECTION CRITERIA	: ≥3 levels with ≥10 observations and ≥ 100 m weighted RMS.	

ONLY THE WORST LEVEL IS SHOWN WITH UNWEIGHTED RMS

WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS	NUM LEVELS
25563	00	Z	250	65/ 178	20	0	47.7	95.6	106.9	5
42027	00	Z	1000	34/ 75	22	0	17.7	40.3	44.0	8
42027	12	Z	100	34/ 75	13	0	155.8	-30.0	158.7	5
42101	12	Z	150	30/ 76	20	1	88.4	89.8	126.0	7
42182	12	Z	100	29/ 77	24	2	76.3	127.7	148.7	6
42314	00	Z	100	27/ 95	11	0	118.8	41.8	125.9	4
42314	12	Z	150	27/ 95	13	0	113.2	20.5	115.0	6
42339	12	Z	150	26/ 73	11	2	111.6	-16.1	112.7	6
42369	00	Z	100	27/ 81	15	1	138.3	64.6	152.6	5
42369	12	Z	100	27/ 81	16	0	133.1	76.4	153.5	5
42397	00	Z	200	27/ 88	15	0	114.9	-17.0	116.1	8
42492	00	Z	100	26/ 85	24	0	121.7	-51.5	132.1	5
42492	12	Z	150	26/ 85	25	0	105.6	-9.9	106.0	5
42647	00	Z	100	23/ 73	15	2	97.5	-88.7	131.8	5
42647	12	Z	200	23/ 73	19	0	57.3	74.0	93.6	7
42667	12	Z	150	23/ 77	20	0	84.1	56.8	101.4	5
42701	00	Z	150	23/ 85	21	0	85.4	60.6	104.7	4
42701	12	Z	200	23/ 85	15	1	86.8	37.9	94.7	7
42867	00	Z	200	21/ 79	24	0	79.9	-35.3	87.3	6
42867	12	Z	150	21/ 79	24	0	75.0	70.2	102.8	7
42971	00	Z	200	20/ 86	23	0	75.0	24.1	78.7	7
42971	12	Z	100	20/ 86	15	1	122.0	-1.5	122.0	7
43003	12	Z	200	19/ 73	26	0	55.7	91.8	107.4	5
43014	00	Z	150	20/ 75	12	7	91.5	-173.6	196.2	6
43014	12	Z	200	20/ 75	17	0	107.6	-57.8	122.1	5
43041	12	Z	150	19/ 82	11	1	98.8	16.3	100.1	5
43128	00	Z	100	17/ 78	25	0	115.0	-36.3	120.6	4
43185	00	Z	250	16/ 81	26	1	80.0	-8.9	80.5	5
43185	12	Z	200	16/ 81	20	0	95.2	23.6	98.1	7
43192	00	Z	150	15/ 74	21	0	105.0	-64.6	123.2	6
43279	00	Z	150	13/ 80	25	0	96.4	-14.4	97.5	4
43279	12	Z	150	13/ 80	25	0	96.5	95.4	135.7	7
43285	12	Z	150	13/ 75	11	1	91.1	126.7	156.0	8
43295	00	Z	100	13/ 78	18	0	134.7	47.2	142.7	6
43295	12	Z	100	13/ 78	14	0	100.6	84.9	131.6	5
43346	00	Z	100	11/ 80	22	0	75.1	-120.7	142.1	4
43346	12	Z	150	11/ 80	26	0	89.0	96.3	131.1	7
43353	00	Z	100	10/ 76	12	0	97.0	-102.3	140.9	6
43353	12	Z	150	10/ 76	18	1	74.6	64.4	98.5	4
43369	00	Z	100	8/ 73	17	0	92.1	-152.9	178.5	5
43369	12	Z	250	8/ 73	21	0	93.1	-0.4	93.1	6
53463	12	Z	200	41/ 112	28	0	26.4	79.9	84.2	4
53772	00	Z	200	38/ 113	27	0	27.6	90.1	94.3	6
53772	12	Z	200	38/ 113	30	0	31.6	82.1	87.9	4
53915	00	Z	1000	36/ 107	28	0	13.8	50.5	52.3	5
54497	00	Z	200	40/ 124	28	0	41.4	73.7	84.5	4
56080	00	Z	1000	35/ 103	1	27	0.0	92.0	92.0	4
56080	12	Z	1000	35/ 103	23	7	20.0	70.8	73.5	4
58203	00	Z	150	33/ 116	29	0	33.6	111.4	116.3	5
58203	12	Z	100	33/ 116	29	0	57.6	122.6	135.4	4
58424	00	Z	150	31/ 117	29	0	24.2	109.9	112.5	4
58424	12	Z	100	31/ 117	27	0	40.2	133.6	139.5	4
84628	12	Z	850	-12/ -77	22	0	10.7	-72.3	73.1	8
89009	00	Z	400	-90/ 0	25	0	69.3	40.1	80.1	5
89512	00	Z	1000	-71/ 12	13	8	60.4	52.2	79.8	8
89664	00	Z	1000	-78/ 167	17	0	30.6	-43.6	53.3	9
96163	00	Z	850	-1/ 100	13	1	28.5	-26.8	39.2	4
96237	00	Z	150	-2/ 106	12	1	78.3	-74.3	107.9	6

AVAILABILITY – TEMP – 500 HPA GEOPOTENTIAL – JUNE 1998

FIGURE 8

ALL HOURS

10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS

GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS – 1155

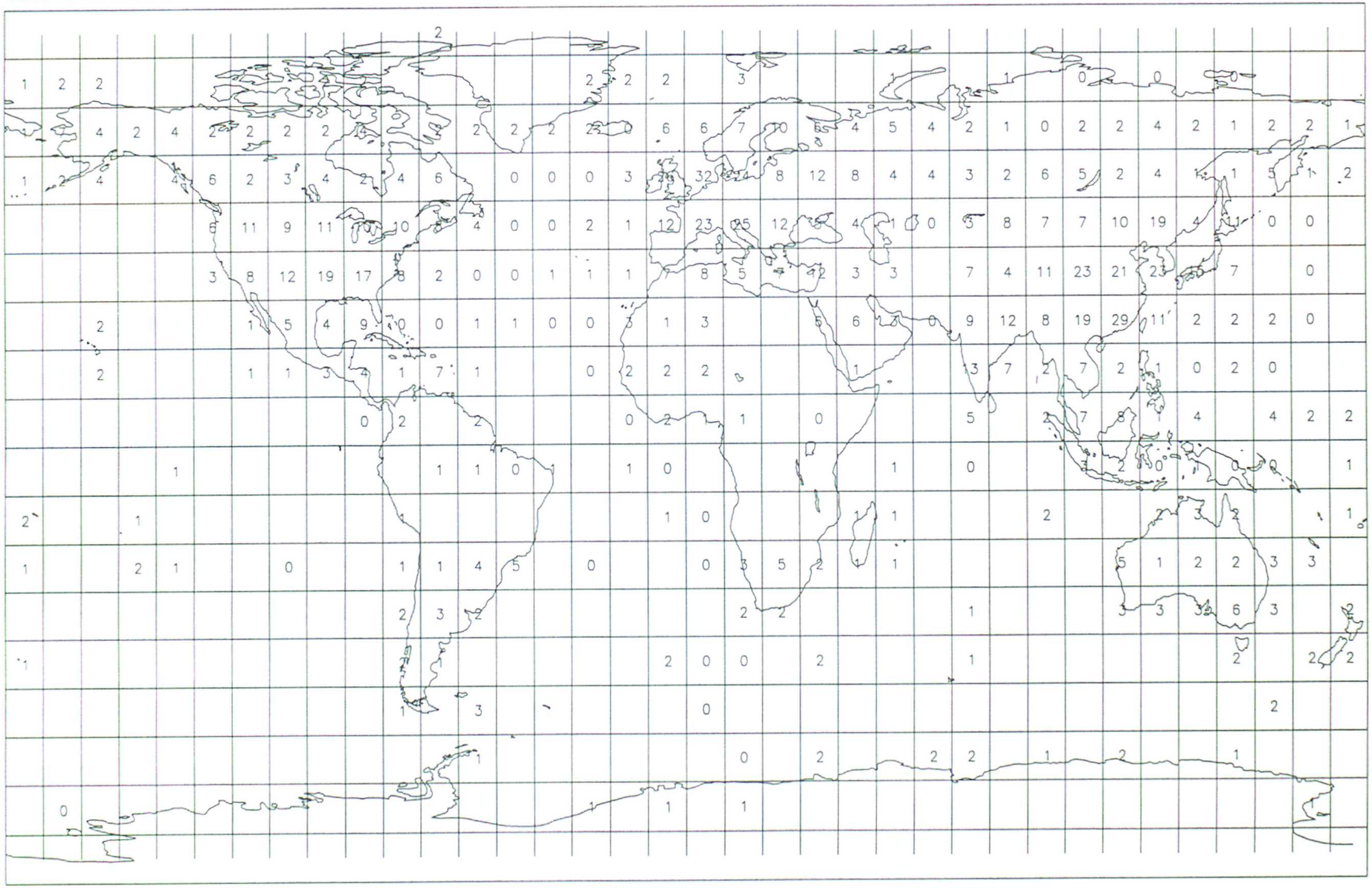

2
1 2 2 2 2 2 3 1 1 0 0 0
4 2 4 2 2 2 2 4 2 2 2 2 23 0 6 6 7 10 6 4 5 4 2 1 0 2 2 4 2 1 2 2 1
1 2 4 4 6 2 3 4 2 4 6 0 0 0 3 26 32 24 8 12 8 4 4 3 2 6 5 2 4 1 1 5 1 2
6 11 9 11 10 10 8 4 0 0 2 1 12 23 25 12 8 4 1 0 3 8 7 7 10 19 4 11 0 0
3 8 12 19 17 8 2 0 0 1 1 1 7 8 5 7 12 3 3 7 4 11 23 21 23 15 7 0
2 1 5 4 9 10 0 1 1 0 0 3 1 3 6 6 3 0 9 12 8 19 29 11 2 2 2 0
2 1 1 3 4 1 7 1 0 2 2 2 1 13 7 2 7 2 1 0 2 0
0 2 2 0 2 1 0 5 2 7 8 1 4 4 2 2
1 1 1 0 1 1 0 1 0 2 0 0 1
2 1 1 1 0 1 1 2 2 3 2 1 1
1 2 1 0 1 1 4 5 0 0 3 5 2 1 1 5 1 2 2 3 3
2 3 2 2 2 1 3 3 3 6 3 2
1 1 2 0 0 2 1 2 2 2 2
1 3 0 2
1 0 2 2 2 1 2 1
0 1 1 1

TABLE 6

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: June 1998

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from Bracknell global model.
Observation times		:00 UTC and 12 UTC.
Level(s) monitored		:Standard levels between 1000.0 - 100.0 hPa
Element monitored		:VECTOR WIND in m s^{-1}
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:% REJ	:Percentage of observations rejected by quality control at level shown during period.
	:UBIAS,VBIAS	:Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.
	:NUM LEVELS	:Number of levels satisfying selection criteria.
GROSS ERROR LIMITS	:Defined in Appendix I.2	
SELECTION CRITERIA	: ≥ 10 observations and ≥ 15 m s^{-1} RMS vector wind.	

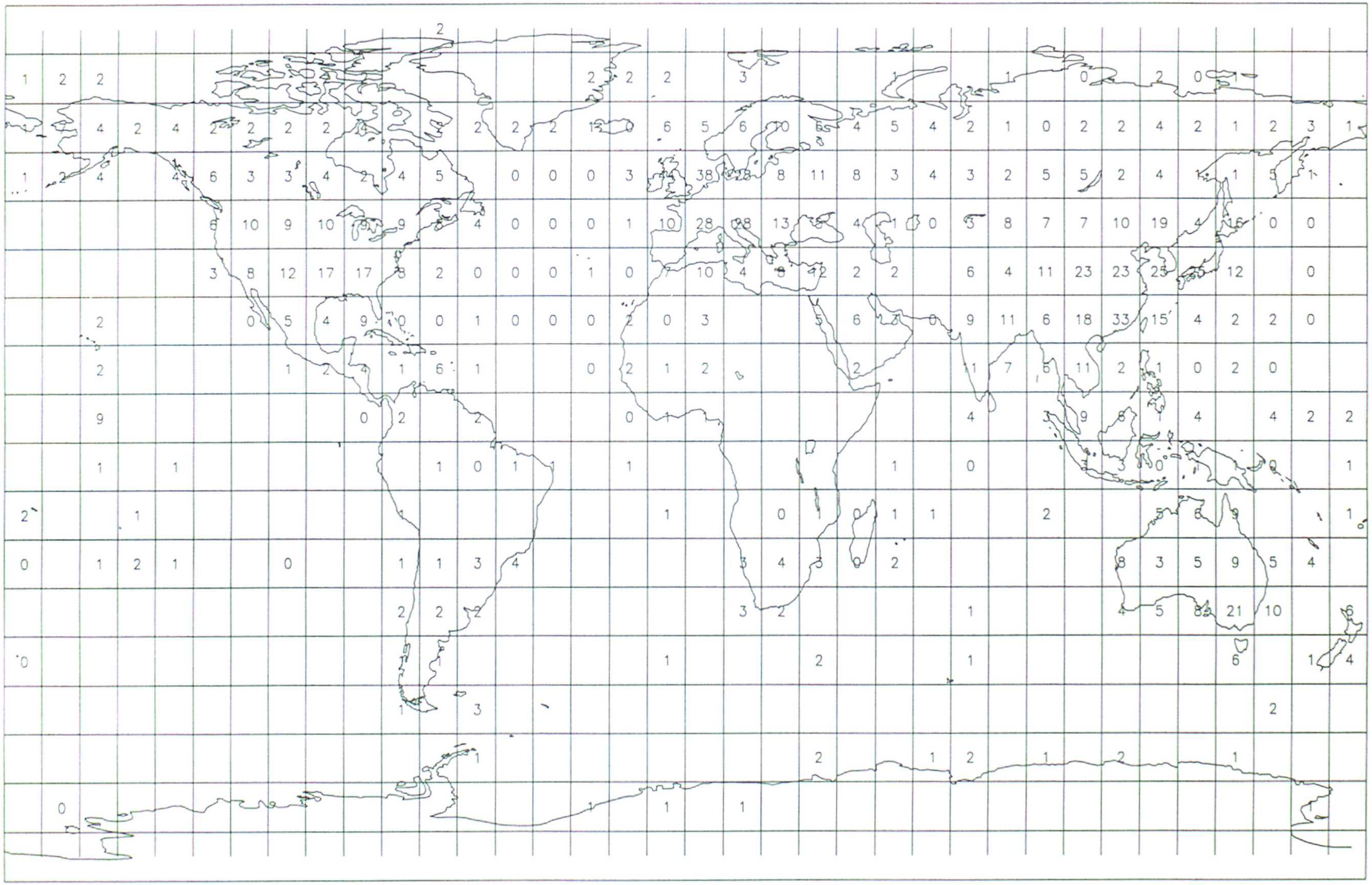
ONLY THE STANDARD LEVEL BETWEEN 1000 - 100 hPa WITH HIGHEST RMS IS SHOWN

```
 WMO  OBS                                NUM   NUM    %
IDENT TIME ELM   LEV    LAT/LONG  OBS  GROSS  REJ   UBIAS   VBIAS    RMS   LEVELS

48455  12   V    100     14/ 101   20      0    5    10.1     7.0    15.7      1
68263  12   V    200    -26/  28   12      0   16   -10.9    -4.9    18.0      1
68442  12   V    200    -29/  26   14      0    7   -10.7    -4.9    16.0      2
83612  00   V    250    -20/ -55   15      0    6     6.3    -2.4    17.3      1
83612  12   V    150    -20/ -55   20      0   15     2.1     2.1    21.0      3

89009  00   V    300    -90/   0   25      0  100     0.2    10.6    20.1      3
```

AVAILABILITY – TEMP/PILOT – 300 HPA WIND – JUNE 1998 FIGURE 9
ALL HOURS
10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS
GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS – 1278


2
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4 2 4 2 2 2 2 2 2 2 1 6 5 6 10 6 4 5 4 2 1 0 2 2 4 2 1 2 3 1
1 2 4 4 6 3 3 4 2 4 5 0 0 0 3 4 38 28 8 11 8 3 4 3 2 5 5 2 4 1 1 5 1
6 10 9 10 9 9 4 0 0 0 1 10 28 28 13 5 4 1 0 0 3 8 7 7 10 19 4 16 0 0
3 8 12 17 17 8 2 0 0 0 1 0 7 10 4 8 12 2 2 6 4 11 23 23 25 25 12 0
2 0 5 4 9 0 0 1 0 0 0 2 0 3 5 6 2 0 9 11 6 18 33 15 4 2 2 0
2 1 2 4 1 6 1 0 2 1 2 2 11 7 5 11 2 1 0 2 0
9 0 2 2 0 1 4 3 9 6 1 4 4 2 2
1 1 1 0 1 1 1 1 0 3 0 0 1
2 1 1 1 0 0 1 1 2 5 6 9 1
0 1 2 1 0 1 1 3 4 3 4 3 0 2 8 3 5 9 5 4
2 2 2 3 2 1 4 5 8 21 10 6
0 1 1 2 1 6 1 4
1 3 2
1 2 1 2 1 2 1
0 1 1 1 1

TABLE 7

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: June 1998

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from Bracknell global model.
Observation times		:00 UTC and 12 UTC.
Level(s) monitored		:Standard levels between 500.0 - 150.0 hPa
Element monitored		:WIND DIRECTION in degrees
Parameters monitored		
	:NUM OBS	:Average number of observations at all levels.
	:BIAS	:Mean difference of observations from background values from all levels.
	:MAX SPREAD	:(For observation - background values) Maximum absolute difference of SD at any level from SD at all levels
	:SD	:SD of difference of observations from background values at all levels.

SELECTION CRITERIA

:NUM OBS ≥ 5, and
ABSOLUTE BIAS ≥ 10°, with
SD < 30°, and
MAX SPREAD < 10°

WMO IDENT	OBS TIME	ELM	LAT/LONG	NUM OBS	BIAS	MAX SPREAD	SD
17240	12	DD	38/ 31	19	-10.6	9.3	15.8
17280	00	DD	38/ 40	26	-11.7	8.9	15.6
31873	12	DD	46/ 134	10	10.7	5.8	12.1
41114	12	DD	18/ 43	17	10.0	6.6	28.3
42397	00	DD	27/ 88	6	13.6	5.6	17.6
44288	12	DD	46/ 103	13	-10.8	8.7	14.0
56137	00	DD	31/ 97	20	10.9	9.0	28.7
57127	00	DD	33/ 107	27	-14.5	8.0	15.8
58633	00	DD	29/ 119	27	10.7	2.2	13.6
58847	00	DD	26/ 119	23	11.3	6.5	19.8
58847	12	DD	26/ 119	23	10.4	8.3	21.8
59280	12	DD	24/ 113	21	11.4	9.1	26.1
59316	00	DD	23/ 117	22	10.0	8.7	20.3
60571	00	DD	32/ -2	7	16.5	7.0	22.3
62337	00	DD	31/ 34	28	-24.3	5.9	11.3
62337	12	DD	31/ 34	22	-25.0	6.6	10.9
78384	12	DD	19/ -81	21	-14.3	3.9	18.9
78866	12	DD	18/ -63	19	-12.7	9.3	16.1
96996	12	DD	-12/ 97	13	10.6	4.4	29.9

MONITORING OF SATELLITE WINDS

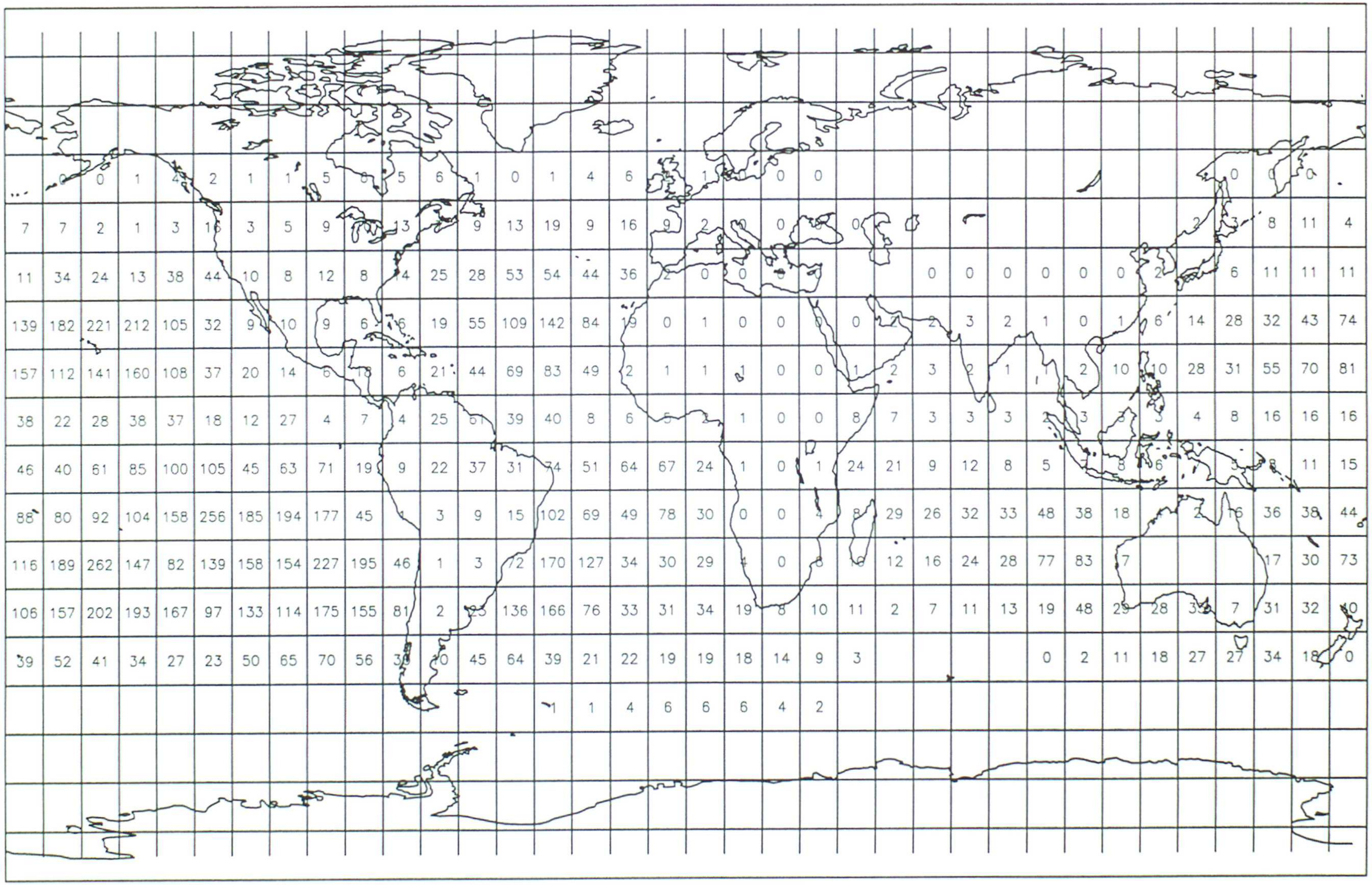
MONITORING CENTRE: BRACKNELL

MONTH: June 1998

Monitoring procedures

Period	:One calendar month.
Data monitored	:Reports from GOES, METEOSAT, GMS, INSAT.
Standard of comparison	:Background field from Bracknell global model.
Selection Criteria	:number of observations > 10.
Data Extracted	:Layer 701 - 1000 hPa 401 - 700 hPa 101 - 400 hPa
	:Mean wind
	:Mean observation minus background vector wind differences
	:Mean observation minus background speed differences
	:RMS of observation minus background vector differences

AVERAGE DAILY NUMBER OF SATOB OBSERVATIONS BETWEEN 701 AND 1000 HPA FIGURE 10
JUNE 1998



	0	0	1	4	2	1	1	5	0	5	6	1	0	1	4	6	5	1	0	0	0											0	0	0	
7	7	2	1	3	16	3	5	9	10	13	7	9	13	19	9	16	9	2	0	0	0	0									2	3	8	11	4
11	34	24	13	38	44	10	8	12	8	14	25	28	53	54	44	36	2	0	0	0	0			0	0	0	0	0	0	2		6	11	11	11
139	182	221	212	105	32	9	10	9	6	6	19	55	109	142	84	19	0	1	0	0	0	0	2	2	3	2	1	0	1	6	14	28	32	43	74
157	112	141	160	108	37	20	14	6	18	6	21	44	69	83	49	2	1	1	1	0	0	1	2	3	2	1	1	2	10	10	28	31	55	70	81
38	22	28	38	37	18	12	27	4	7	4	25	61	39	40	8	6	5	2	1	0	0	8	7	3	3	3	2	3	3	3	4	8	16	16	16
46	40	61	85	100	105	45	63	71	19	9	22	37	31	74	51	64	67	24	1	0	1	24	21	9	12	8	5	7	8	6	7	3	8	11	15
88	80	92	104	158	256	185	194	177	45	4	3	9	15	102	69	49	78	30	0	0	4	8	29	26	32	33	48	38	18	4	2	16	36	38	44
116	189	262	147	82	139	158	154	227	195	46	1	3	72	170	127	34	30	29	4	0	8	10	12	16	24	28	77	83	7				17	30	73
106	157	202	193	167	97	133	114	175	155	81	2	23	136	166	76	33	31	34	19	8	10	11	2	7	11	13	19	48	29	28	33	7	31	32	10
39	52	41	34	27	23	50	65	70	56	30	10	45	64	39	21	22	19	19	18	14	9	3					0	2	11	18	27	27	34	18	0
														1	1	4	6	6	6	4	2														

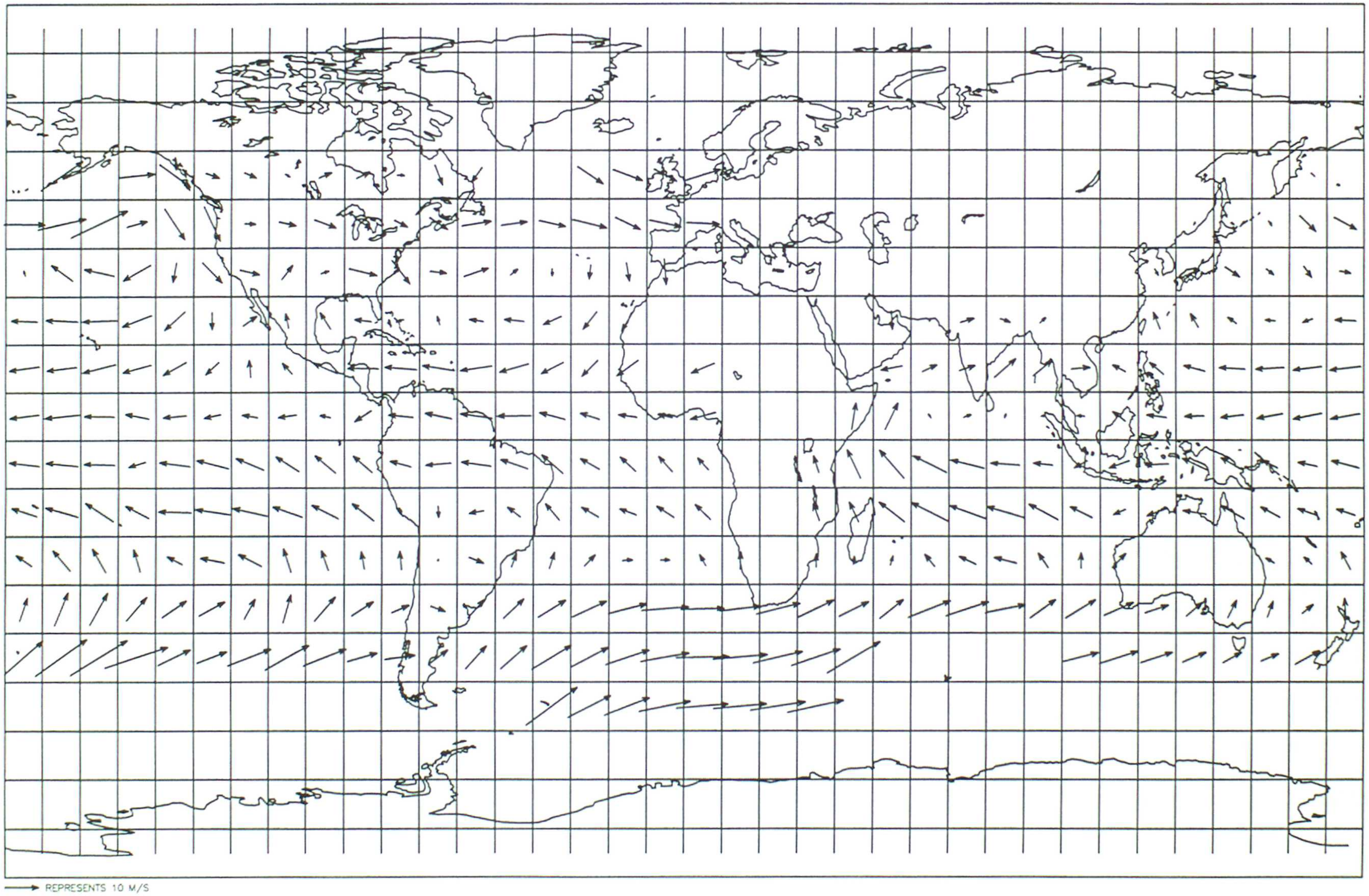
SATOB VECTOR MEAN WINDS BETWEEN 701–1000 HPA

JUNE 1998

ALL OBSERVATIONS

ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

FIGURE 11


REPRESENTS 10 M/S

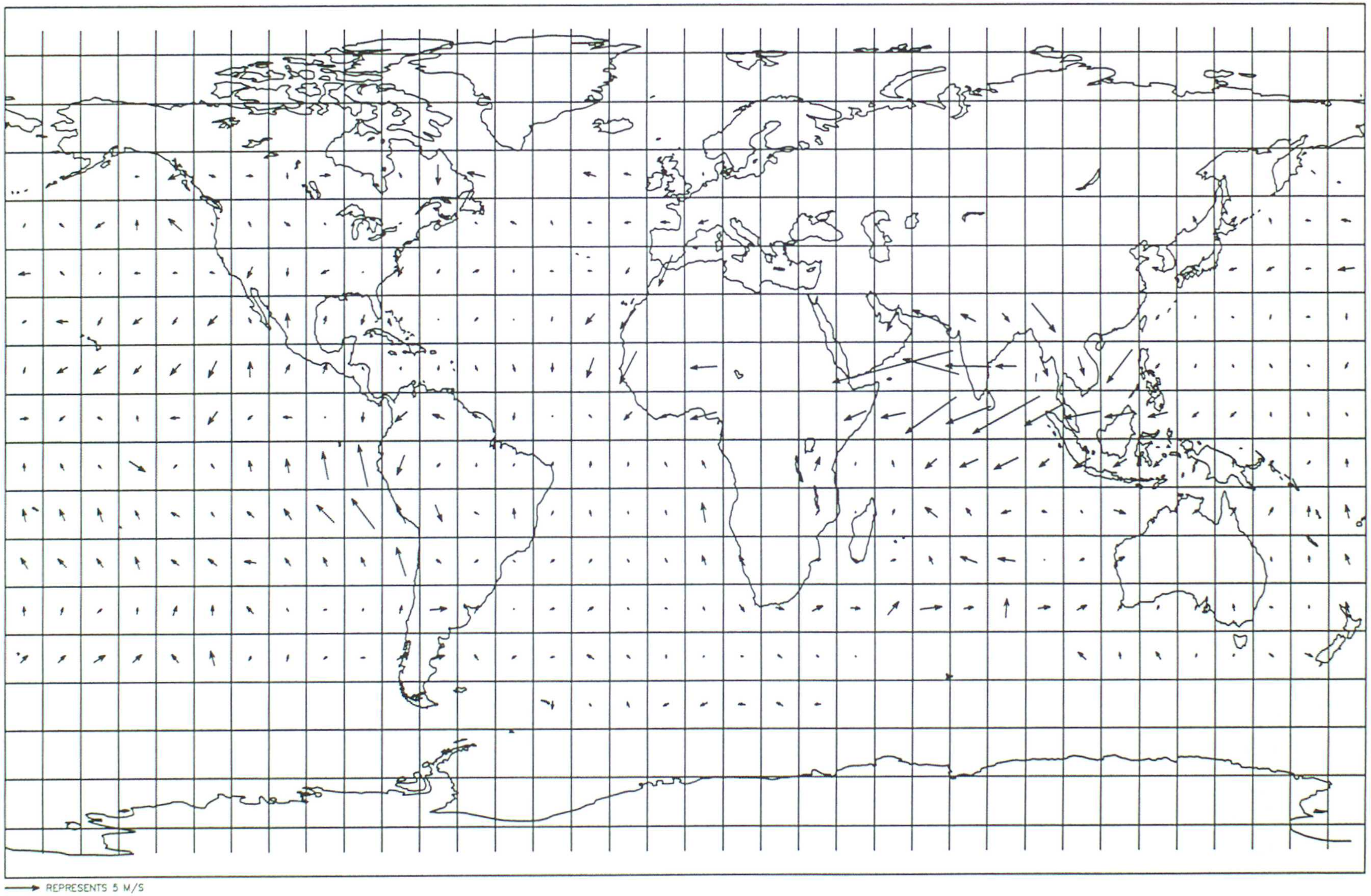
SATOB O-B VECTOR WIND DIFFERENCES BETWEEN 701–1000 HPA

JUNE 1998

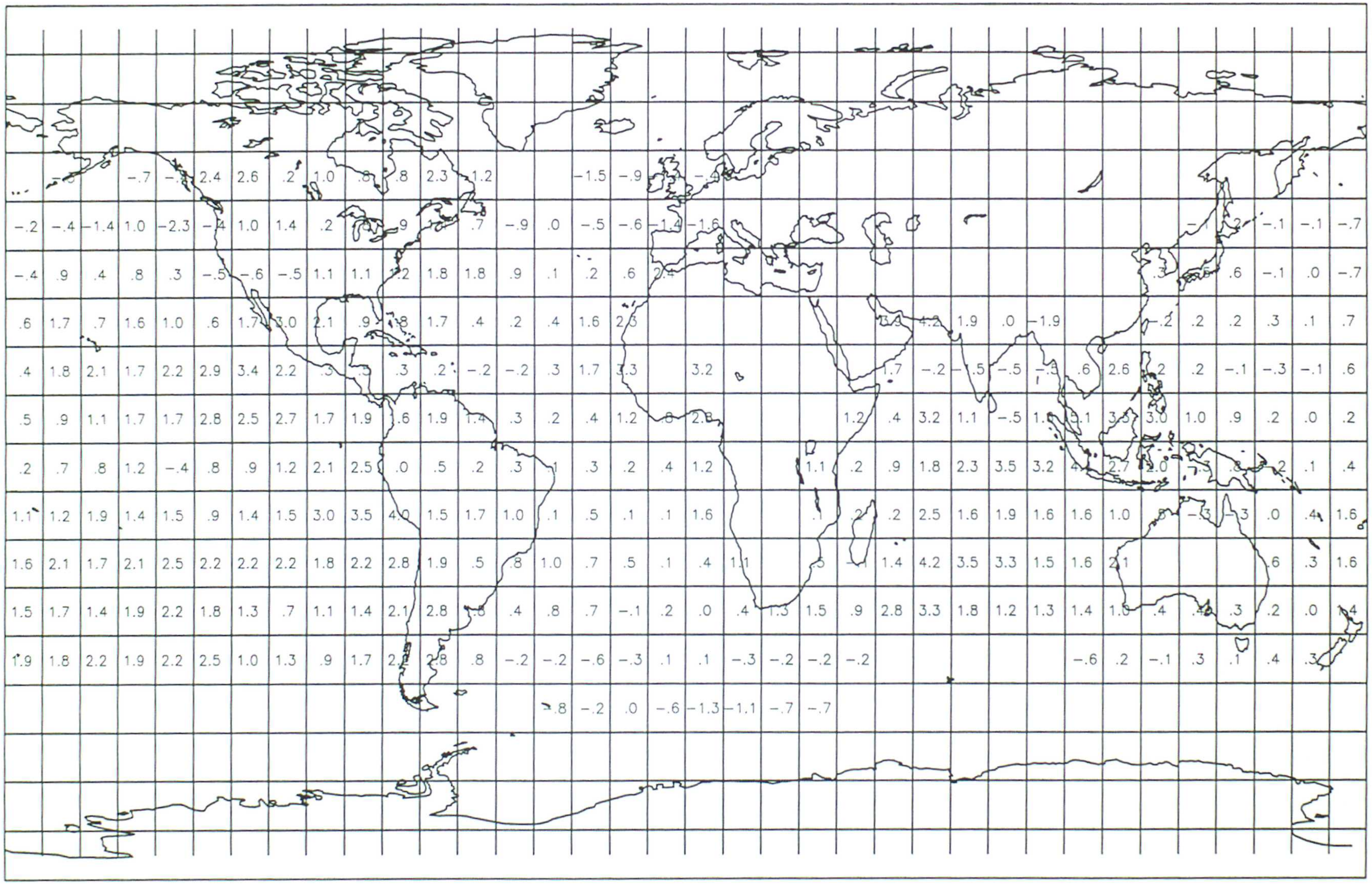
ALL OBSERVATIONS

ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

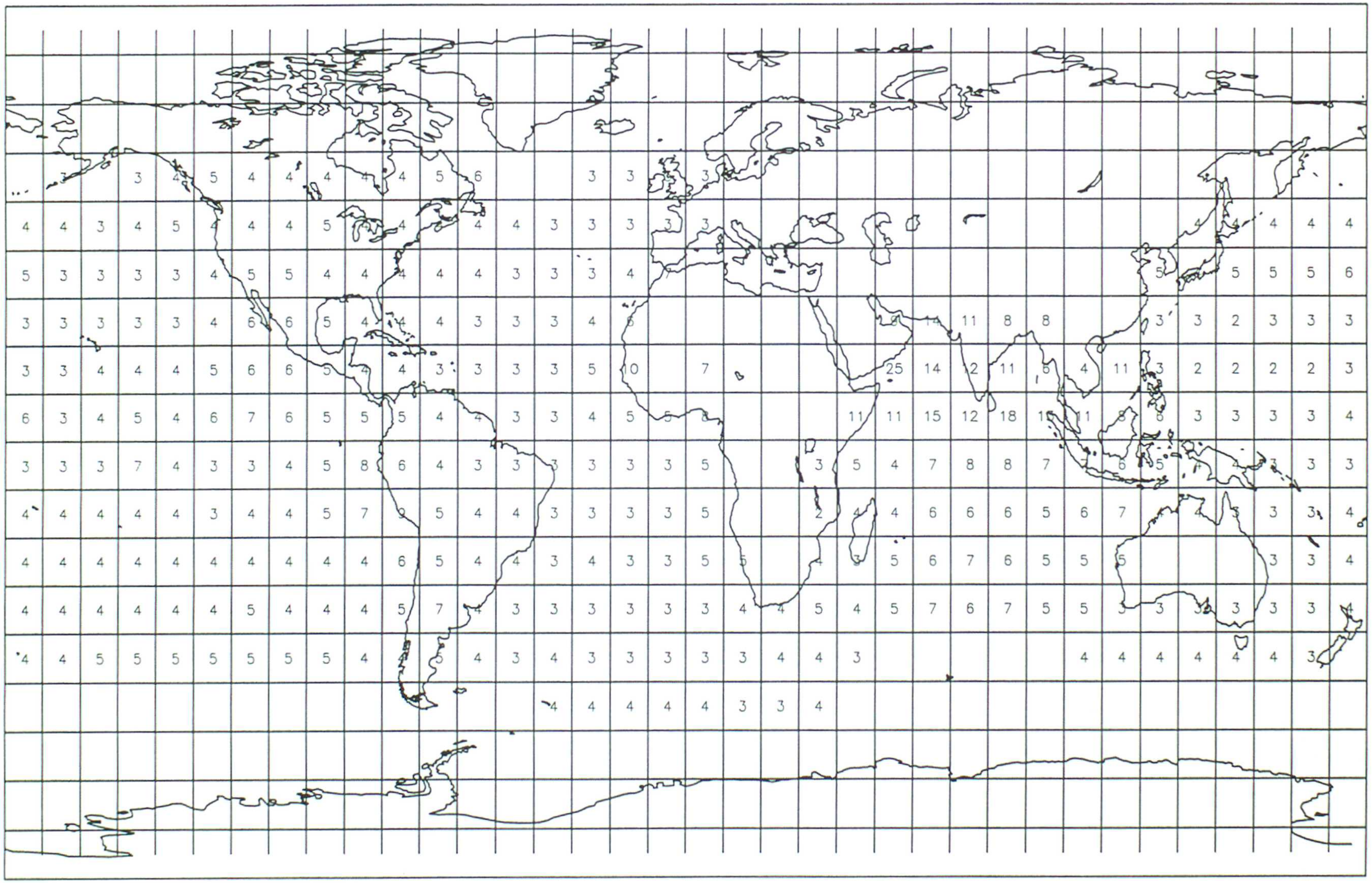
FIGURE 12


REPRESENTS 5 M/S

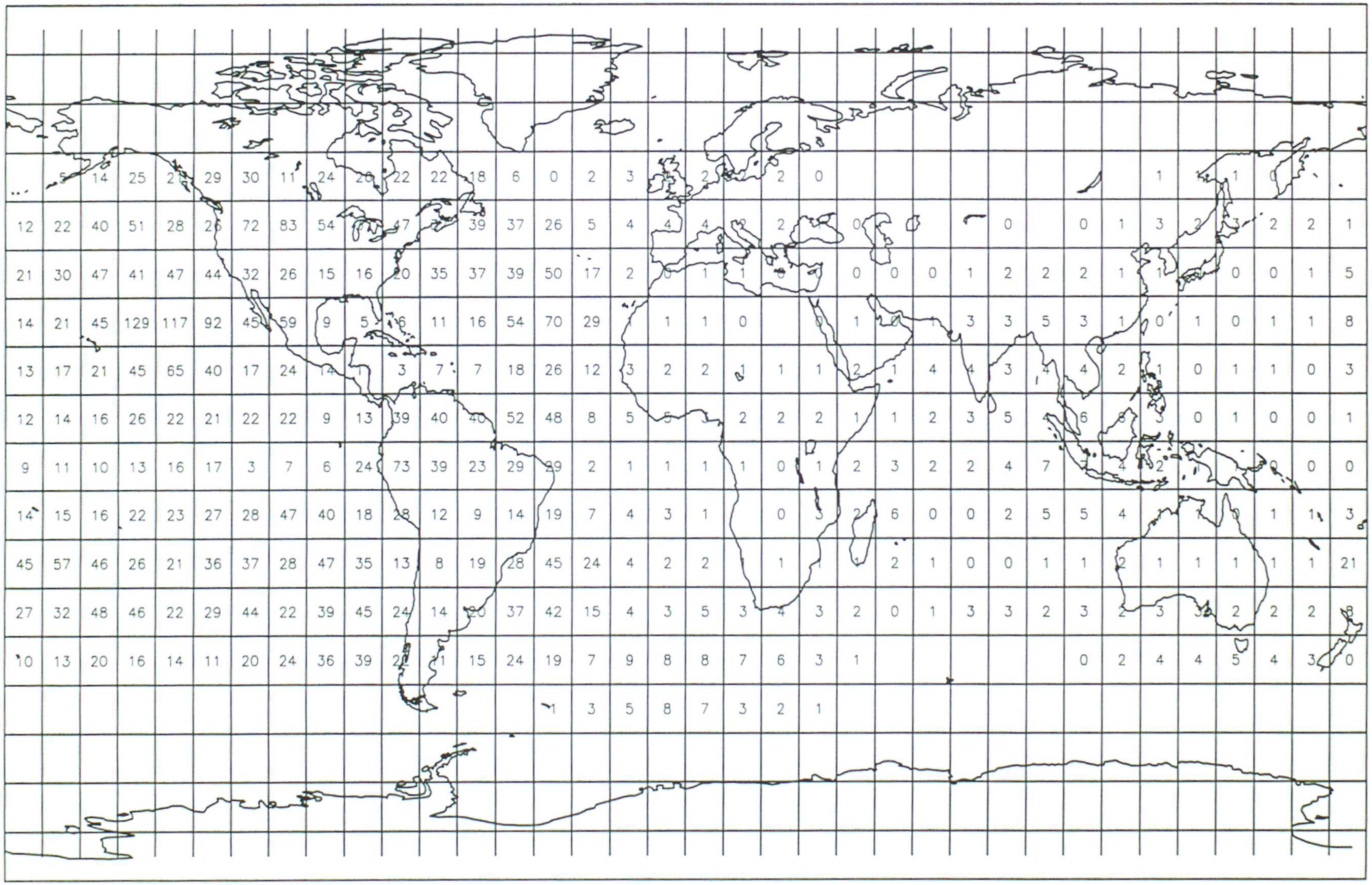
SATOBS : MEAN O–B SPEED DIFFERENCES (M/S) BETWEEN 701 AND 1000 HPA FIGURE 13
JUNE 1998
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT



SATOBS : RMS O-B VECTOR DIFFERENCES (M/S) BETWEEN 701 AND 1000 HPA FIGURE 14
JUNE 1998
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT


3 3 4 5 4 4 4 4 4 5 6 3 3 3 3
4 4 3 4 5 4 4 4 5 4 4 4 4 3 3 3 3 3 4 4 4 4 4
5 3 3 3 3 4 5 5 4 4 4 4 4 3 3 3 4 7 5 5 5 5 6
3 3 3 3 3 4 6 6 5 4 4 4 3 3 3 4 6 8 14 11 8 8 3 3 2 3 3 3
3 3 4 4 4 5 6 6 5 4 4 3 3 3 3 5 10 7 25 14 12 11 6 4 11 3 2 2 2 2 3
6 3 4 5 4 6 7 6 5 5 5 4 4 3 3 4 5 5 8 11 11 15 12 18 15 11 8 6 3 3 3 3 4
3 3 3 7 4 3 3 4 5 8 6 4 3 3 3 3 3 3 5 3 5 4 7 8 8 7 7 6 5 4 4 3 3 3
4 4 4 4 4 3 4 4 5 7 9 5 4 4 3 3 3 3 5 2 4 4 6 6 6 5 6 7 4 4 3 3 3 4
4 4 4 4 4 4 4 4 4 4 6 5 4 4 3 4 3 3 5 5 4 3 5 6 7 6 5 5 5 3 3 4
4 4 4 4 4 4 5 4 4 4 5 7 4 3 3 3 3 3 3 4 4 5 4 5 7 6 7 5 5 3 3 3 3 3 3 4
4 4 5 5 5 5 5 5 5 4 4 5 4 3 4 3 3 3 3 3 4 4 3 4 4 4 4 4 4 3
4 4 4 4 4 3 3 4

AVERAGE DAILY NUMBER OF SATOB OBSERVATIONS BETWEEN 401 AND 700 HPA FIGURE 15
JUNE 1998



	5	14	25	21	29	30	11	24	20	22	22	18	6	0	2	3	2	2	2	2	0									1	1	1	0		
12	22	40	51	28	26	72	83	54	[illegible]	47	[illegible]	39	37	26	5	4	4	4	2	2	1	0				0		0	1	3	2	3	2	2	1
21	30	47	41	47	44	32	26	15	16	20	35	37	39	50	17	2	0	1	1	0	0	0	0	0	1	2	2	2	1	1	[illegible]	0	0	1	5
14	21	45	129	117	92	45	59	9	5	6	11	16	54	70	29	1	1	1	0		0	1	0	1	3	3	5	3	1	0	1	0	1	1	8
13	17	21	45	65	40	17	24	14	1	3	7	7	18	26	12	3	2	2	1	1	1	2	1	4	4	3	4	4	2	1	0	1	1	0	3
12	14	16	26	22	21	22	22	9	13	39	40	40	52	48	8	5	5	3	2	2	2	1	1	2	3	5	4	6	8	3	0	1	0	0	1
9	11	10	13	16	17	3	7	6	24	73	39	23	29	29	2	1	1	1	1	0	1	2	3	2	2	4	7	7	4	2	1	1	0	0	0
14	15	16	22	23	27	28	47	40	18	28	12	9	14	19	7	4	3	1		0	3	2	6	0	0	2	5	5	4	1	1	0	1	1	3
45	57	46	26	21	36	37	28	47	35	13	8	19	28	45	24	4	2	2	1	1	1	1	2	1	0	0	1	1	2	1	1	1	1	1	21
27	32	48	46	22	29	44	22	39	45	24	14	20	37	42	15	4	3	5	3	4	3	2	0	1	3	3	2	3	2	3	3	2	2	2	8
10	13	20	16	14	11	20	24	36	39	21	11	15	24	19	7	9	8	8	7	6	3	1						0	2	4	4	5	4	3	0
														1	3	5	8	7	3	2	1														

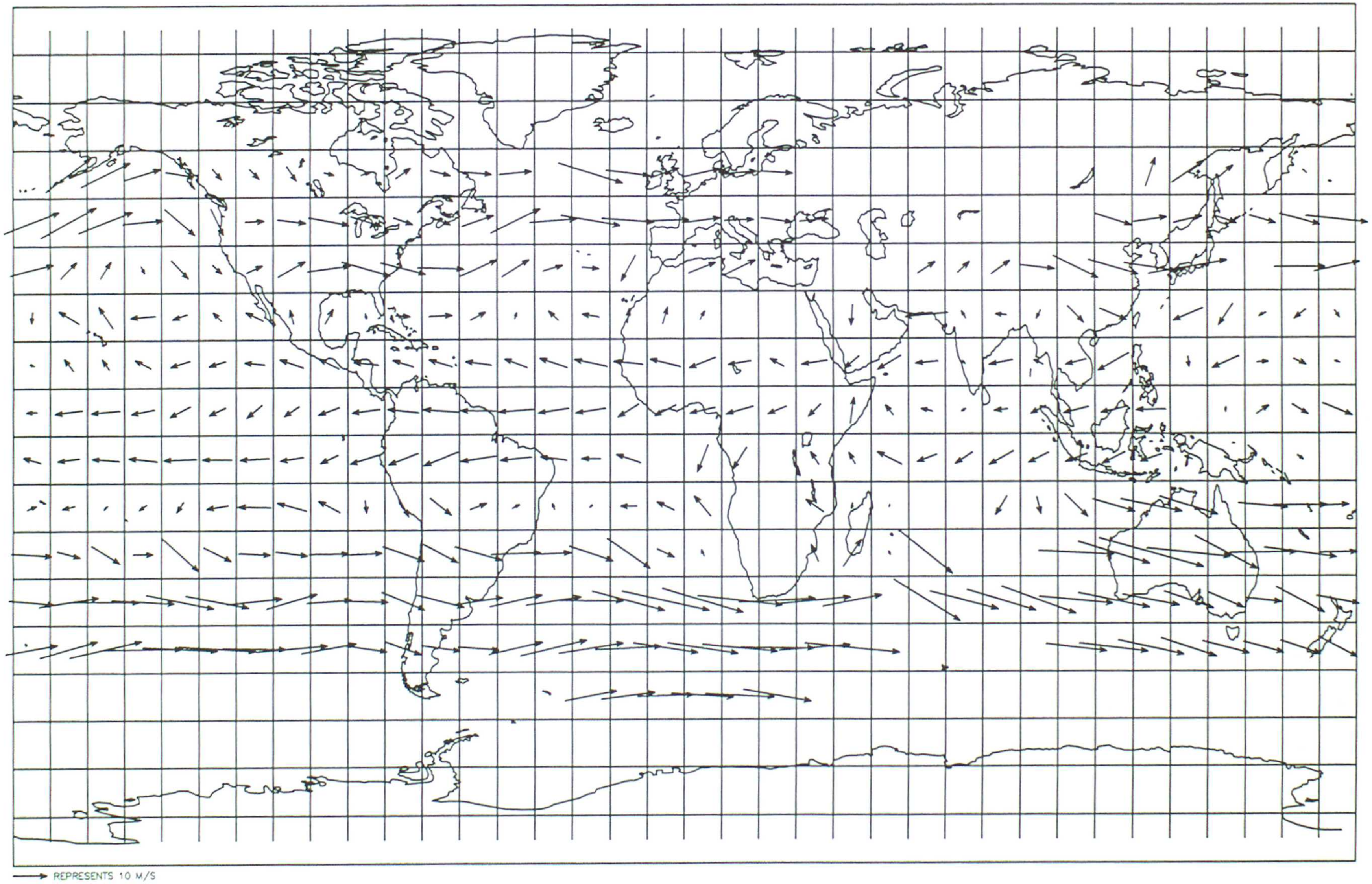
SATOB VECTOR MEAN WINDS BETWEEN 401–700 HPA

JUNE 1998

ALL OBSERVATIONS

ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

FIGURE 16


REPRESENTS 10 M/S

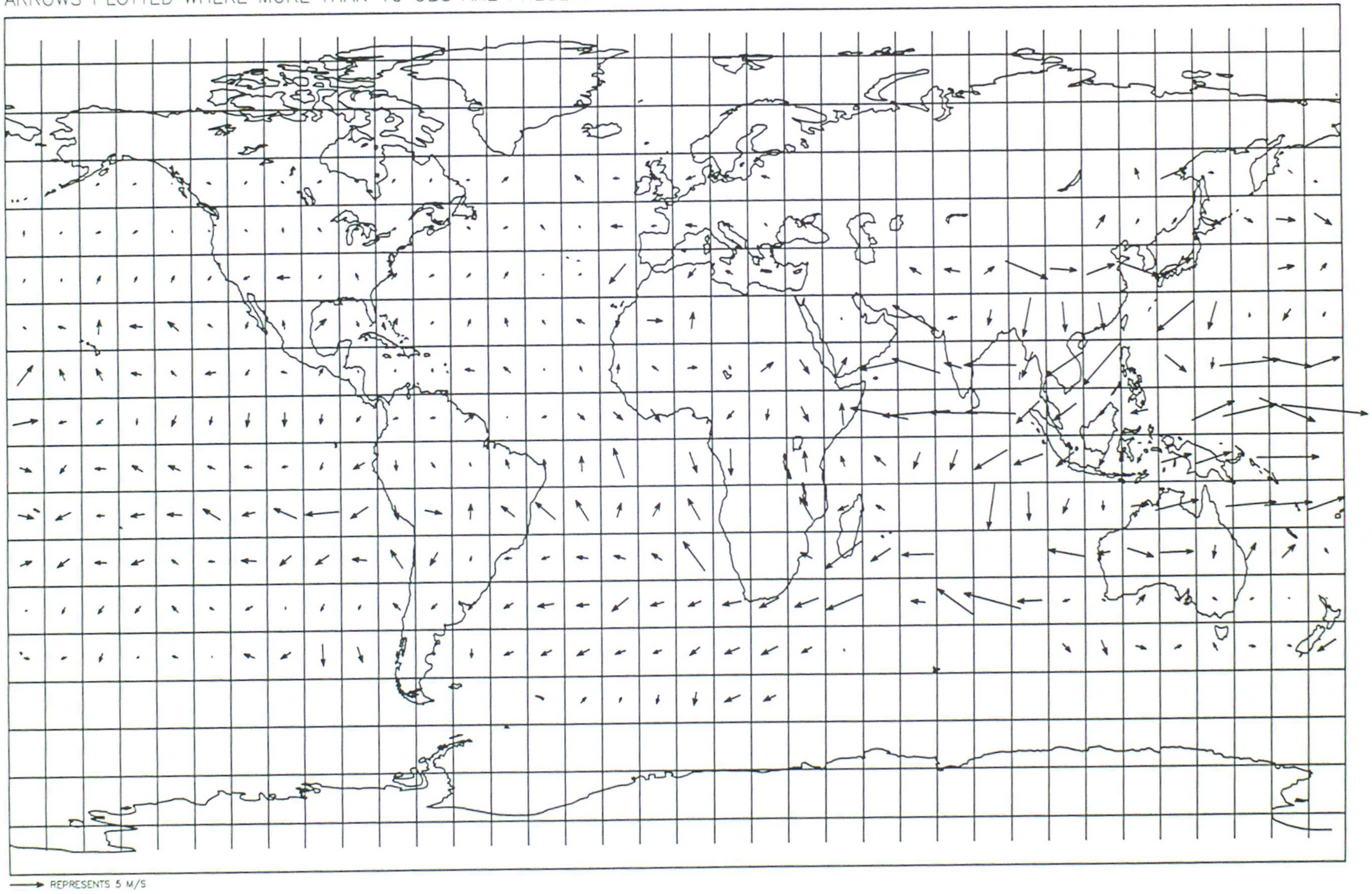
SATOB O-B VECTOR WIND DIFFERENCES BETWEEN 401–700 HPA

FIGURE 17

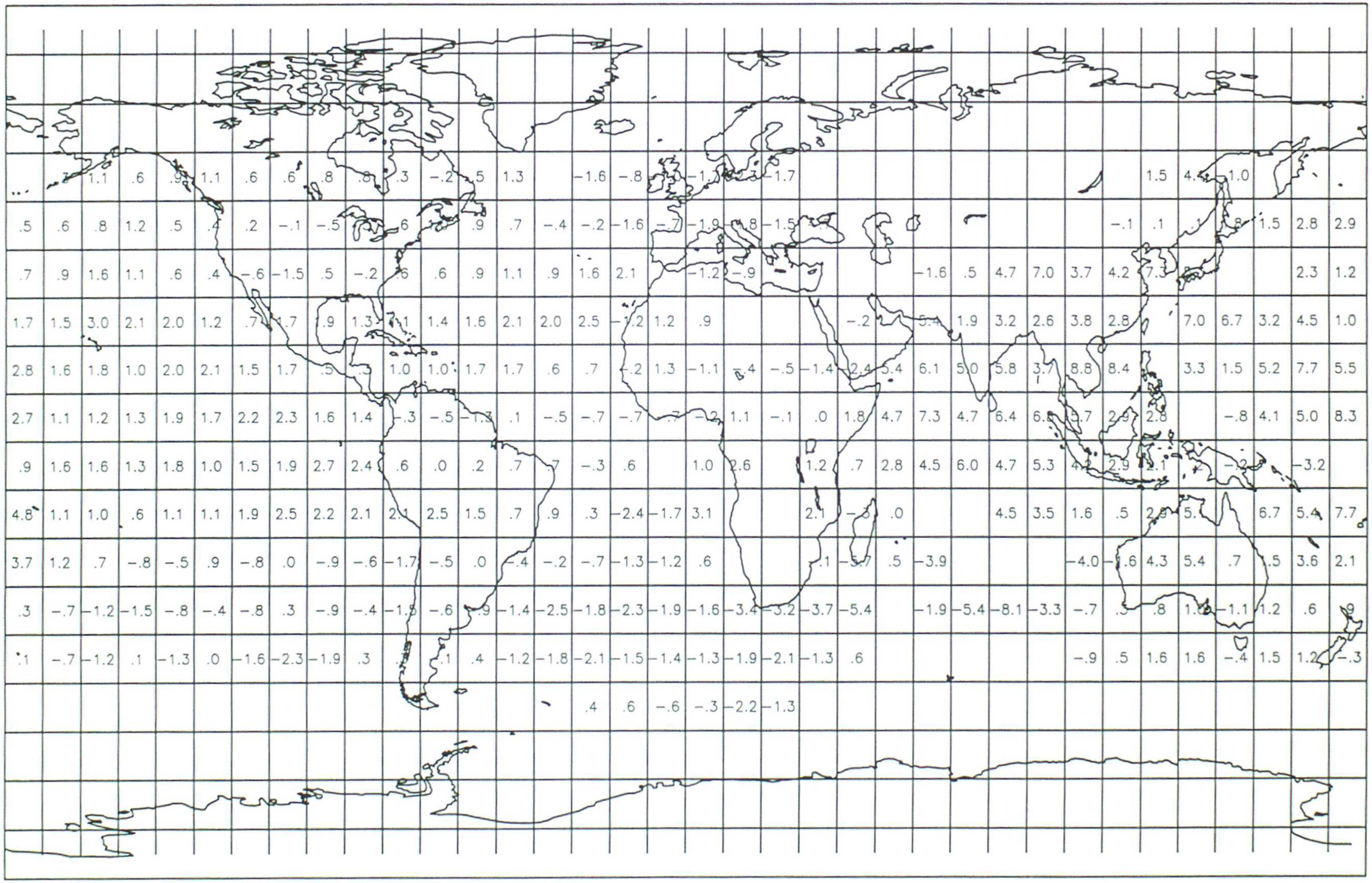
JUNE 1998

ALL OBSERVATIONS

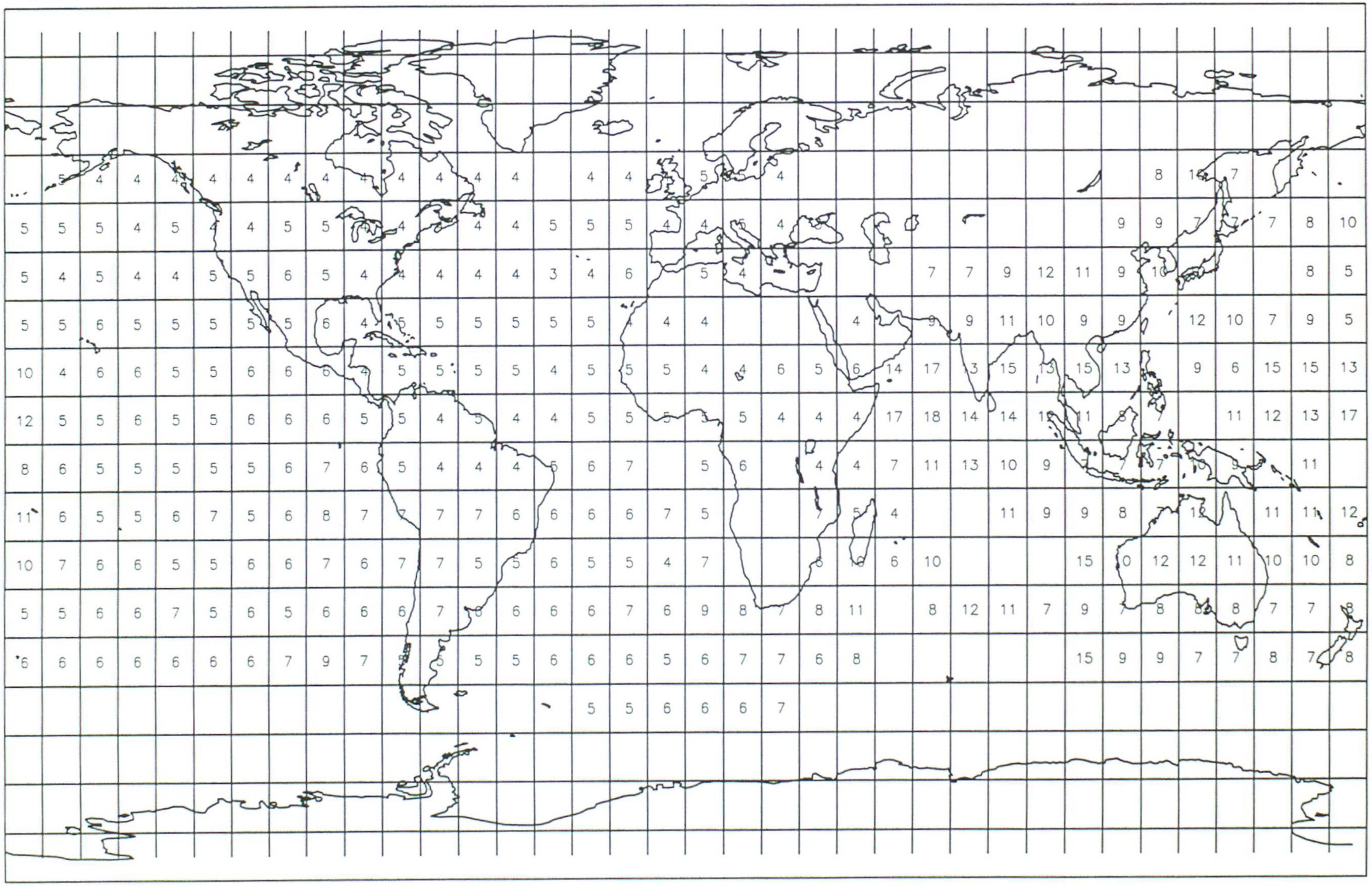
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT


REPRESENTS 5 M/S

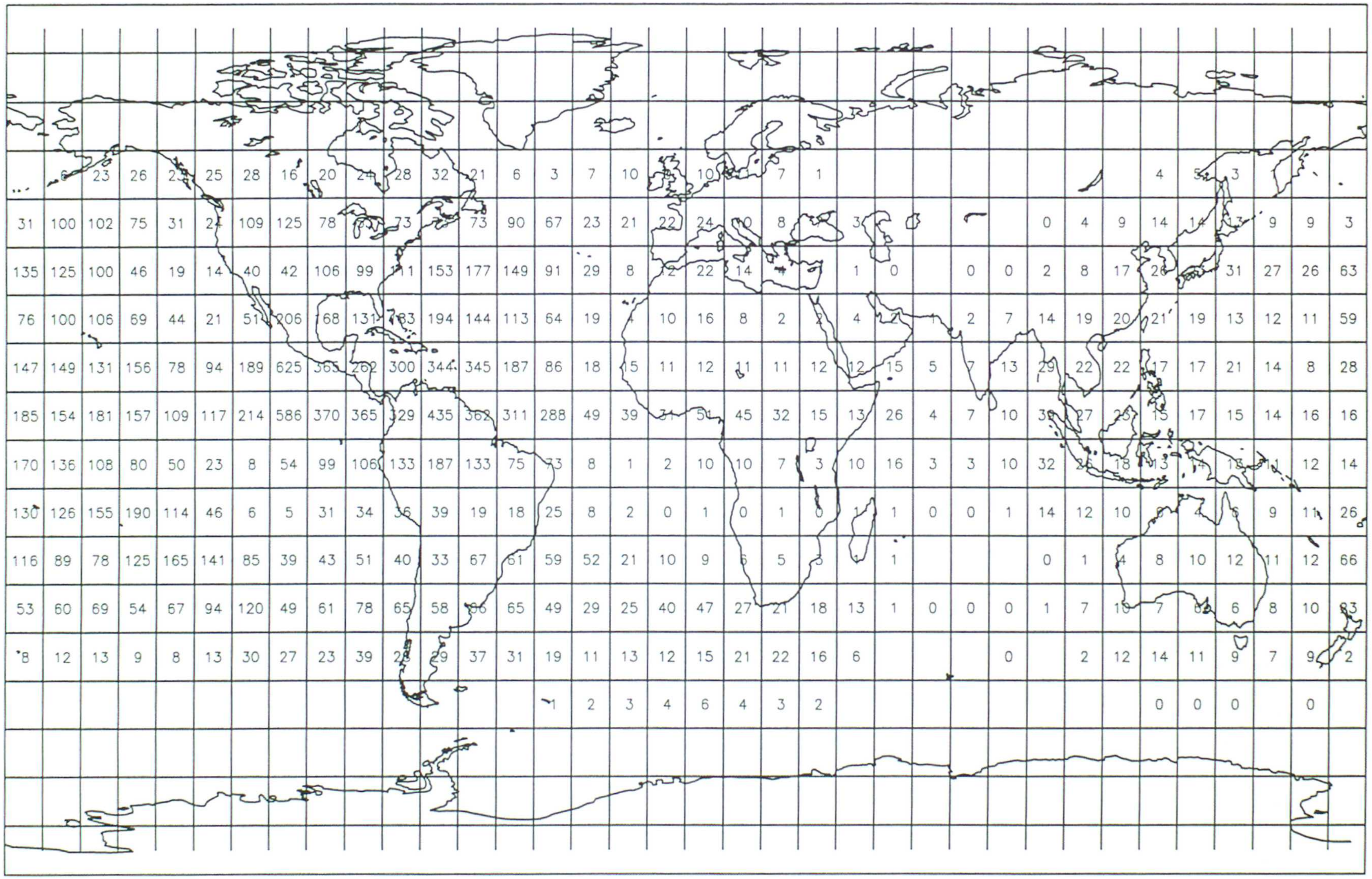
SATOBS : MEAN O−B SPEED DIFFERENCES (M/S) BETWEEN 401 AND 700 HPA FIGURE 18
JUNE 1998
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT


.7 1.1 .6 .9 1.1 .6 .6 .8 .8 .3 −.2 .5 1.3 −1.6 −.8 −1.7 1.5 4.4 1.0
.5 .6 .8 1.2 .5 .4 .2 −.1 −.5 .6 .9 .7 −.4 −.2 −1.6 −.7 −1.9 −.8 −1.5 −.1 .1 .8 1.5 2.8 2.9
.7 .9 1.6 1.1 .6 .4 −.6 −1.5 .5 −.2 .6 .6 .9 1.1 .9 1.6 2.1 −1.2 −.9 −1.6 .5 4.7 7.0 3.7 4.2 7.3 2.3 1.2
1.7 1.5 3.0 2.1 2.0 1.2 .7 1.7 .9 1.3 1.1 1.4 1.6 2.1 2.0 2.5 −1.2 1.2 .9 −.2 5.4 1.9 3.2 2.6 3.8 2.8 7.0 6.7 3.2 4.5 1.0
2.8 1.6 1.8 1.0 2.0 2.1 1.5 1.7 .5 .3 1.0 1.0 1.7 1.7 .6 .7 −.2 1.3 −1.1 .4 −.5 −1.4 2.4 5.4 6.1 5.0 5.8 3.7 8.8 8.4 3.3 1.5 5.2 7.7 5.5
2.7 1.1 1.2 1.3 1.9 1.7 2.2 2.3 1.6 1.4 −.3 −.5 −1.3 .1 −.5 −.7 −.7 −.7 −.2 1.1 −.1 .0 1.8 4.7 7.3 4.7 6.4 6.5 5.7 2.9 2.8 −.8 4.1 5.0 8.3
.9 1.6 1.6 1.3 1.8 1.0 1.5 1.9 2.7 2.4 .6 .0 .2 .7 .7 −.3 .6 1.0 2.6 1.2 .7 2.8 4.5 6.0 4.7 5.3 4.1 2.9 2.1 −.2 −3.2
4.8 1.1 1.0 .6 1.1 1.1 1.9 2.5 2.2 2.1 2.1 2.5 1.5 .7 .9 .3 −2.4 −1.7 3.1 2.1 −.3 .0 4.5 3.5 1.6 .5 2.9 5.1 6.7 5.4 7.7
3.7 1.2 .7 −.8 −.5 .9 −.8 .0 −.9 −.6 −1.7 −.5 .0 .4 −.2 −.7 −1.3 −1.2 .6 .1 −5.7 .5 −3.9 −4.0 −1.6 4.3 5.4 .7 .5 3.6 2.1
.3 −.7 −1.2 −1.5 −.8 −.4 −.8 .3 −.9 −.4 −1.5 −.6 −.9 −1.4 −2.5 −1.8 −2.3 −1.9 −1.6 −3.4 −3.2 −3.7 −5.4 −1.9 −5.4 −8.1 −3.3 −.7 .3 .8 1.6 −1.1 1.2 .6 .9
.1 −.7 −1.2 .1 −1.3 .0 −1.6 −2.3 −1.9 .3 .1 .4 −1.2 −1.8 −2.1 −1.5 −1.4 −1.3 −1.9 −2.1 −1.3 .6 −.9 .5 1.6 1.6 −.4 1.5 1.2 −.3
.4 .6 −.6 −.3 −2.2 −1.3

SATOBS : RMS O-B VECTOR DIFFERENCES (M/S) BETWEEN 401 AND 700 HPA FIGURE 19
JUNE 1998
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT


5 4 4 4 4 4 4 4 4 4 4 4 4 4 4 5 4 8 14 7
5 5 5 4 5 4 4 5 5 4 4 4 4 5 5 5 4 4 5 4 9 9 7 7 7 8 10
5 4 5 4 4 5 5 6 5 4 4 4 4 4 3 4 6 5 4 7 7 9 12 11 9 10 8 5
5 5 6 5 5 5 5 5 6 4 5 5 5 5 5 5 4 4 4 4 9 9 11 10 9 9 12 10 7 9 5
10 4 6 6 5 5 6 6 6 4 5 5 5 5 4 5 5 5 4 4 6 5 6 14 17 13 15 13 15 13 9 6 15 15 13
12 5 5 6 5 5 6 6 6 5 5 4 5 4 4 5 5 5 3 5 4 4 4 17 18 14 14 11 8 7 11 12 13 17
8 6 5 5 5 5 5 6 7 6 5 4 4 4 5 6 7 5 6 4 4 7 11 13 10 9 7 7 7 10 9 11
11 6 5 5 6 7 5 6 8 7 7 7 7 6 6 6 6 7 5 7 5 4 11 9 9 8 7 12 11 11 12
10 7 6 6 5 5 6 6 7 6 7 7 5 5 6 5 5 4 7 6 10 6 10 15 10 12 12 11 10 10 8
5 5 6 6 7 5 6 5 6 6 6 7 8 6 6 6 7 6 9 8 7 8 11 8 12 11 7 9 7 8 8 8 7 7 8
6 6 6 6 6 6 6 7 9 7 5 5 5 5 6 6 6 5 6 7 7 6 8 15 9 9 7 7 8 7 8
5 5 6 6 6 7

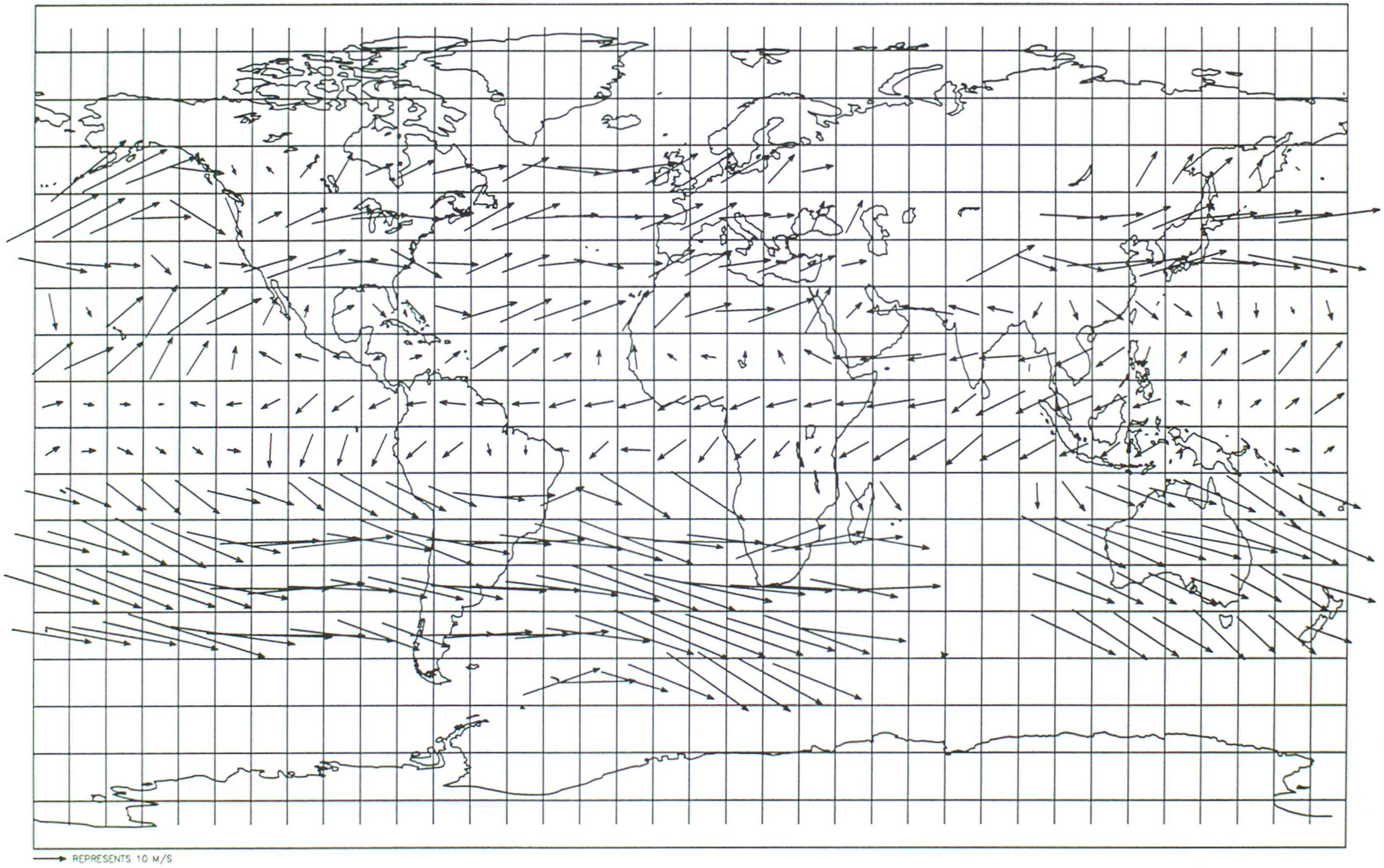
AVERAGE DAILY NUMBER OF SATOB OBSERVATIONS BETWEEN 101 AND 400 HPA FIGURE 20
JUNE 1998



	6	23	26	23	25	28	16	20	24	28	32	21	6	3	7	10	[illegible]	10	[illegible]	7	1									4	5	3			
31	100	102	75	31	24	109	125	78	[illegible]	73	[illegible]	73	90	67	23	21	22	24	10	8	[illegible]	3					0	4	9	14	14	13	9	9	3
135	125	100	46	19	14	40	42	106	99	111	153	177	149	91	29	8	12	22	14	[illegible]	[illegible]	1	0		0	0	2	8	17	26	[illegible]	31	27	26	63
76	100	106	69	44	21	51	206	168	131	183	194	144	113	64	19	4	10	16	8	2	2	4	2	1	2	7	14	19	20	21	19	13	12	11	59
147	149	131	156	78	94	189	625	365	262	300	344	345	187	86	18	15	11	12	11	11	12	12	15	5	7	13	29	22	22	17	17	21	14	8	28
185	154	181	157	109	117	214	586	370	365	329	435	362	311	288	49	39	31	51	45	32	15	13	26	4	7	10	39	27	23	15	17	15	14	16	16
170	136	108	80	50	23	8	54	99	106	133	187	133	75	73	8	1	2	10	10	7	3	10	16	3	3	10	32	26	18	13	14	13	11	12	14
130	126	155	190	114	46	6	5	31	34	36	39	19	18	25	8	2	0	1	0	1	0	1	1	0	0	1	14	12	10	6	4	6	9	11	26
116	89	78	125	165	141	85	39	43	51	40	33	67	61	59	52	21	10	9	6	5	3	1	1				0	1	4	8	10	12	11	12	66
53	60	69	54	67	94	120	49	61	78	65	58	86	65	49	29	25	40	47	27	21	18	13	1	0	0	0	1	7	10	7	6	6	8	10	83
8	12	13	9	8	13	30	27	23	39	28	29	37	31	19	11	13	12	15	21	22	16	6				0		2	12	14	11	9	7	9	2
														1	2	3	4	6	4	3	2									0	0	0		0	

SATOB VECTOR MEAN WINDS BETWEEN 101–400 HPA
JUNE 1998
ALL OBSERVATIONS
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

FIGURE 21


REPRESENTS 10 M/S

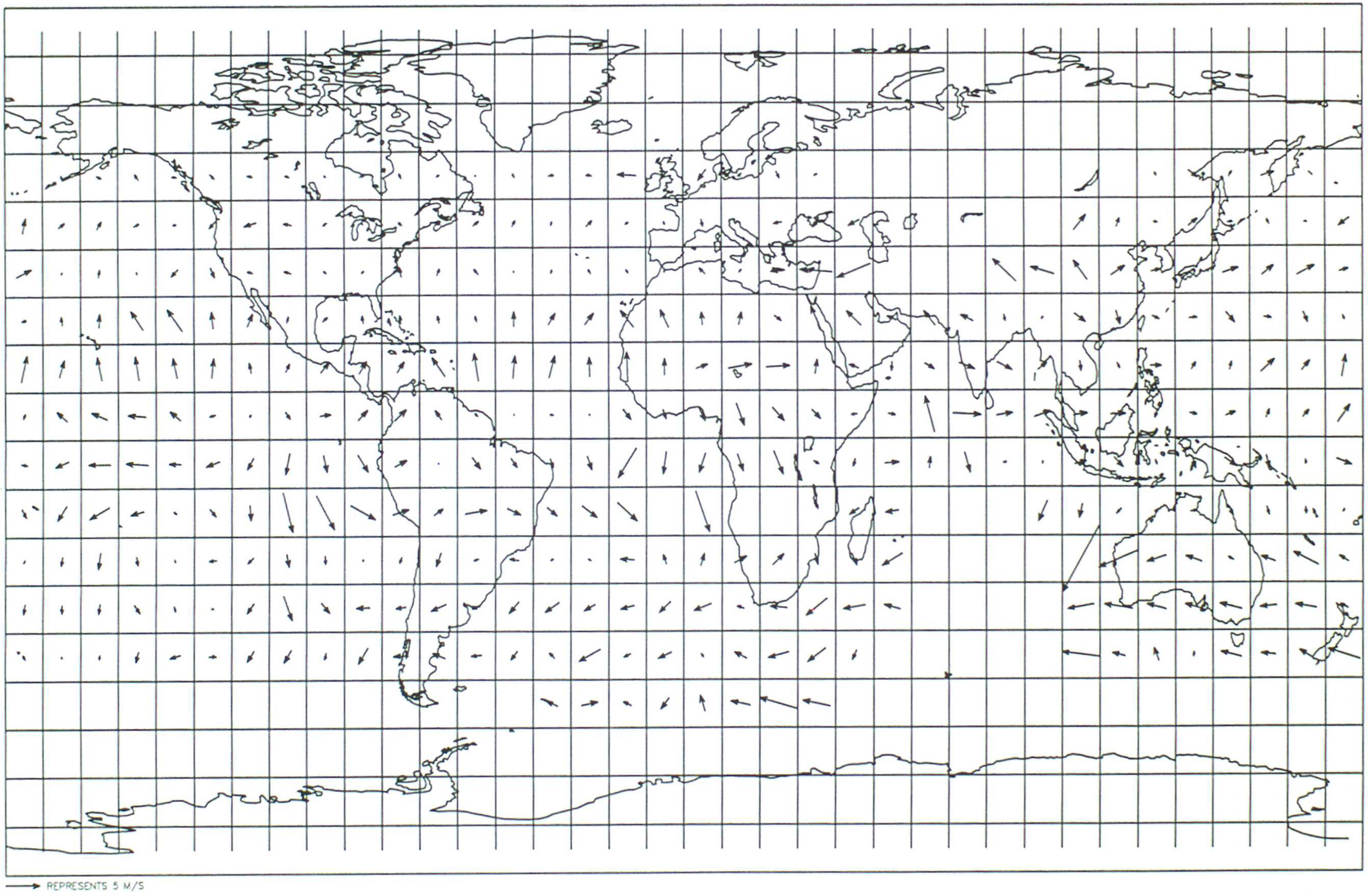
SATOB O−B VECTOR WIND DIFFERENCES BETWEEN 101−400 HPA

FIGURE 22

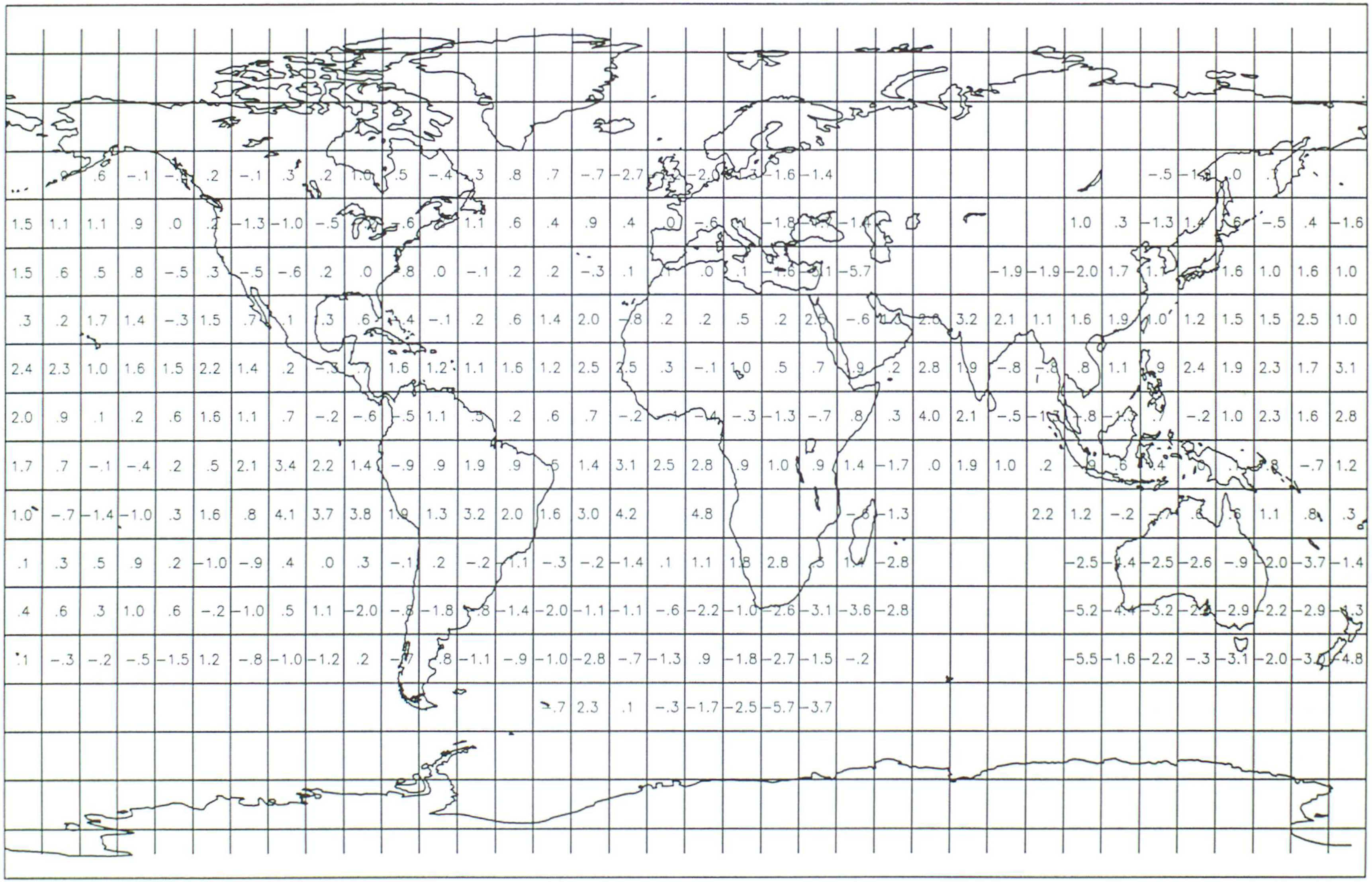
JUNE 1998

ALL OBSERVATIONS

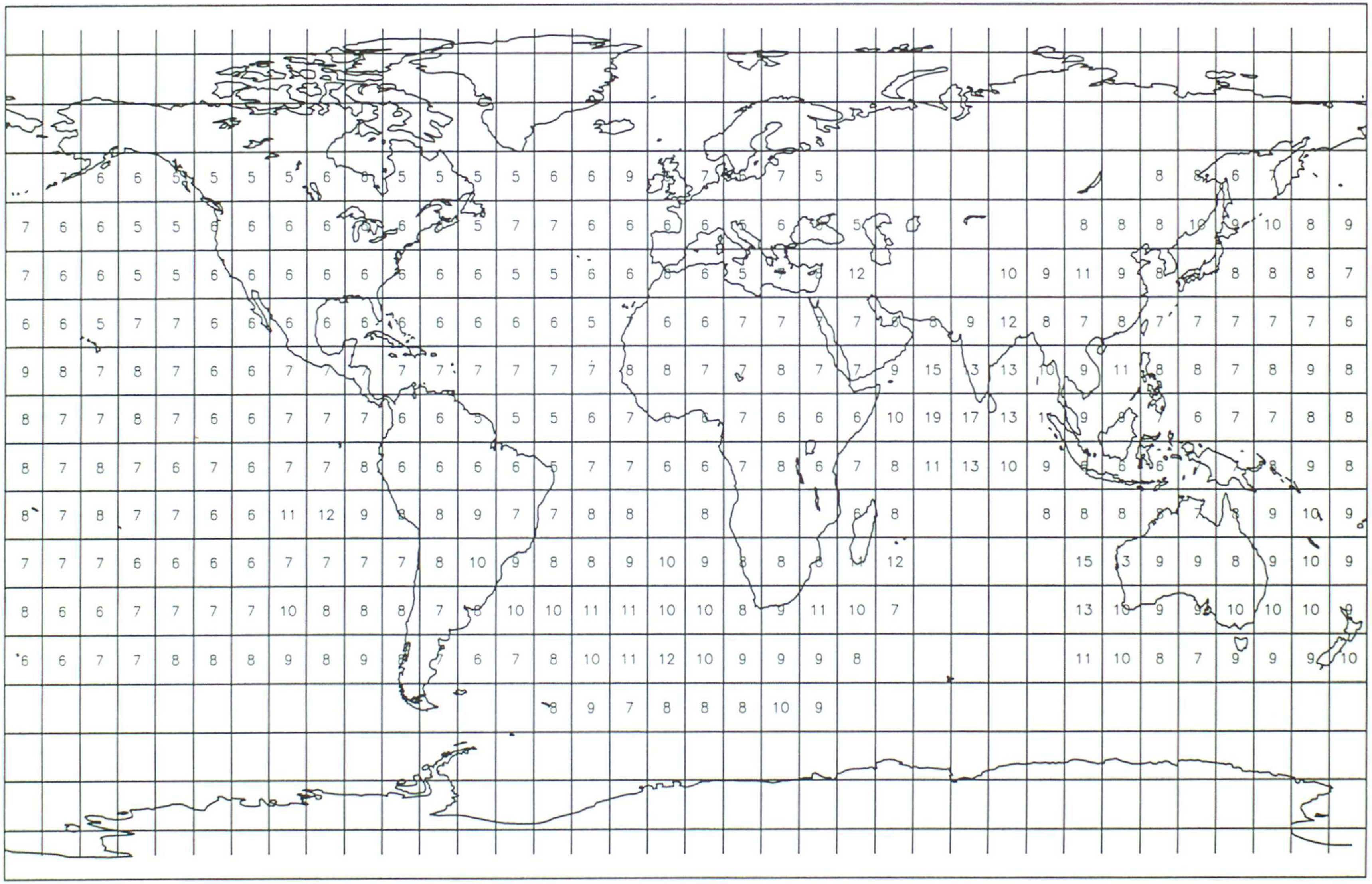
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT


REPRESENTS 5 M/S

SATOBS : MEAN O–B SPEED DIFFERENCES (M/S) BETWEEN 101 AND 400 HPA FIGURE 23
JUNE 1998
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT


.9 .6 −.1 .2 −.1 .3 .2 1.0 .5 −.4 .3 .8 .7 −.7 −2.7 −2.0 −1.3 −1.6 −1.4 −.5 −1.4 .0
1.5 1.1 1.1 .9 .0 .2 −1.3 −1.0 −.5 −.6 1.1 .6 .4 .9 .4 .0 −.6 .1 −1.8 −.7 −1.4 1.0 .3 −1.3 1.4 .6 −.5 .4 −1.6
1.5 .6 .5 .8 −.5 .3 −.5 −.6 .2 .0 .8 .0 −.1 .2 .2 −.3 .1 .1 .0 .1 −1.6 −3.1 −5.7 −1.9 −1.9 −2.0 1.7 1.1 1.6 1.0 1.6 1.0
.3 .2 1.7 1.4 −.3 1.5 .7 .1 .3 .6 .4 −.1 .2 .6 1.4 2.0 −.8 .2 .2 .5 .2 2.5 −.6 1.3 2.0 3.2 2.1 1.1 1.6 1.9 1.0 1.2 1.5 1.5 2.5 1.0
2.4 2.3 1.0 1.6 1.5 2.2 1.4 .2 −.3 .7 1.6 1.2 1.1 1.6 1.2 2.5 2.5 .3 −.1 1.0 .5 .7 .9 .2 2.8 1.9 −.8 −.8 .8 1.1 .9 2.4 1.9 2.3 1.7 3.1
2.0 .9 .1 .2 .6 1.6 1.1 .7 −.2 −.6 −.5 1.1 .5 .2 .6 .7 −.2 −.1 −.4 −.3 −1.3 −.7 .8 .3 4.0 2.1 −.5 −1.3 −.8 −1.3 .7 −.2 1.0 2.3 1.6 2.8
1.7 .7 −.1 −.4 .2 .5 2.1 3.4 2.2 1.4 −.9 .9 1.9 .9 .5 1.4 3.1 2.5 2.8 .9 1.0 .9 1.4 −1.7 .0 1.9 1.0 .2 −.9 .6 .4 .0 .8 −.7 1.2
1.0 −.7 −1.4 −1.0 .3 1.6 .8 4.1 3.7 3.8 1.9 1.3 3.2 2.0 1.6 3.0 4.2 4.8 −.6 −1.3 2.2 1.2 −.2 −.7 .6 .6 1.1 .8 .3
.1 .3 .5 .9 .2 −1.0 −.9 .4 .0 .3 −.1 .2 −.2 −1.1 −.3 −.2 −1.4 .1 1.1 1.8 2.8 .5 1.4 −2.8 −2.5 −1.4 −2.5 −2.6 −.9 −2.0 −3.7 −1.4
.4 .6 .3 1.0 .6 −.2 −1.0 .5 1.1 −2.0 −.8 −1.8 −.8 −1.4 −2.0 −1.1 −1.1 −.6 −2.2 −1.0 −2.6 −3.1 −3.6 −2.8 −5.2 −4.4 −3.2 −2.3 −2.9 −2.2 −2.9 −1.3
.1 −.3 −.2 −.5 −1.5 1.2 −.8 −1.0 −1.2 .2 −.7 −.8 −1.1 −.9 −1.0 −2.8 −.7 −1.3 .9 −1.8 −2.7 −1.5 −.2 −5.5 −1.6 −2.2 −.3 −3.1 −2.0 −3.0 −4.8
−.7 2.3 .1 −.3 −1.7 −2.5 −5.7 −3.7

SATOBS : RMS O-B VECTOR DIFFERENCES (M/S) BETWEEN 101 AND 400 HPA FIGURE 24
JUNE 1998
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT



MONITORING OF SATELLITE TEMPERATURES

MONITORING CENTRE: BRACKNELL

MONTH: June 1998

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from NOAA-11, NOAA-14 500 km.

Standard of comparison :Background field from Bracknell global model.

Selection Criteria :All SATEM soundings where number of observations > 30.

Data Extracted :Layer: 850 - 1000 hPa
100 - 300 hPa
30 - 50 hPa

:Mean observation minus background temperature differences

NO DATA AVAILABLE

TABLE 8

MONTHLY MONITORING OF MARINE SURFACE OBSERVATIONS (COSNA)
DATA TYPE:- DRIFTER
MONITORING CENTRE: BRACKNELL
MONTH: June 1998

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for drifting buoy.

Area monitored :10°N - 80°N, 85°W - 0°W

Standard of comparison :Background field from Bracknell global model.

Position :Average latitude and longitude for period.

Observation times :All hours combined.

Elements monitored :Mean sea-level pressure (hPa)
:Wind speed (m s^{-1})
:Wind direction (degrees)

Parameters monitored

:NOBS :Number of observations received excluding duplicates.

:NGE :Number of observations with gross errors.

:PGE :Percentage of observations with gross errors.

:SD :SD of difference of observations from background values excluding those with gross errors.

:BIAS :Mean difference of observations from background values excluding those with gross errors.
N.B. A positive bias indicates the observation is veered to the background

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors

GROSS ERROR LIMITS :15 hPa (pressure)
:25 m s^{-1} (Vector Wind)

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE											
13502	15.8	-39.1	ALL	P	SUR	211	0	0	0.8	0.7	1.1
13503	20.7	-35.3	ALL	P	SUR	228	0	0	0.8	-0.2	0.8
13906	27.6	-51.0	ALL	P	SUR	229	0	0	0.8	0.0	0.8
13912	18.0	-66.4	ALL	P	SUR	31	0	0	1.1	-1.5	1.9
13913	17.4	-57.7	ALL	P	SUR	194	0	0	1.1	0.0	1.1
41502	20.8	-42.6	ALL	P	SUR	186	0	0	0.8	0.3	0.8
41503	15.3	-52.0	ALL	P	SUR	217	0	0	0.8	0.3	0.9
41506	15.9	-61.6	ALL	P	SUR	167	0	0	1.6	0.6	1.7
41520	17.5	-42.8	ALL	P	SUR	203	0	0	0.8	0.9	1.2
41521	21.6	-53.9	ALL	P	SUR	240	0	0	0.8	0.4	0.9
41524	17.9	-62.9	ALL	P	SUR	19	0	0	0.8	-4.9	5.0
41597	33.3	-24.6	ALL	P	SUR	428	0	0	0.7	0.0	0.7
41598	25.7	-80.2	ALL	P	SUR	40	0	0	0.9	0.6	1.1
41599	25.7	-80.2	ALL	P	SUR	55	0	0	1.0	0.0	1.0
41600	25.7	-80.2	ALL	P	SUR	6	0	0	0.7	0.1	0.7
41601	25.7	-80.2	ALL	P	SUR	45	2	4	1.6	0.5	1.6
41625	25.7	-80.2	ALL	P	SUR	2	0	0	0.3	0.3	0.4
41626	25.7	-80.2	ALL	P	SUR	3	0	0	0.4	0.3	0.5
41631	25.7	-80.2	ALL	P	SUR	49	2	4	1.1	0.1	1.1
41632	25.7	-80.2	ALL	P	SUR	42	6	14	0.9	0.2	0.9
41633	25.7	-80.2	ALL	P	SUR	41	1	2	1.0	0.3	1.1
41634	25.7	-80.2	ALL	P	SUR	50	0	0	1.1	0.6	1.2
41635	25.7	-80.2	ALL	P	SUR	74	3	4	1.2	0.0	1.2
41636	25.7	-80.2	ALL	P	SUR	70	1	1	0.9	0.1	0.9
41637	25.7	-80.2	ALL	P	SUR	26	0	0	1.0	-0.1	1.0
41638	25.7	-80.2	ALL	P	SUR	43	1	2	2.0	-0.6	2.1
41924	24.2	-48.9	ALL	P	SUR	190	0	0	0.9	-1.7	1.9
42534	45.2	-42.3	ALL	P	SUR	21	0	0	1.1	-0.4	1.2
44601	52.9	-48.4	ALL	P	SUR	646	52	8	1.1	0.2	1.1
44602	52.8	-39.5	ALL	P	SUR	596	32	5	1.1	0.4	1.2
44603	54.6	-49.7	ALL	P	SUR	632	0	0	1.1	-0.4	1.2
44604	43.7	-46.6	ALL	P	SUR	437	0	0	1.0	0.1	1.0
44606	51.1	-47.7	ALL	P	SUR	799	0	0	1.1	0.1	1.1
44609	58.4	-22.4	ALL	P	SUR	1221	2	0	1.0	0.2	1.1
44613	40.2	-35.4	ALL	P	SUR	671	1	0	0.8	0.0	0.8
44614	57.0	-33.8	ALL	P	SUR	395	1	0	1.1	-0.1	1.1
44616	53.4	-24.6	ALL	P	SUR	1138	1	0	1.2	0.0	1.2
44617	52.6	-24.1	ALL	P	SUR	1006	7	1	1.5	0.0	1.5
44621	57.1	-13.2	ALL	P	SUR	903	4	0	0.9	0.0	0.9
44726	54.0	-40.3	ALL	P	SUR	845	0	0	1.1	0.0	1.1
44727	60.5	-19.9	ALL	P	SUR	2033	7	0	0.9	0.1	0.9
44742	45.6	-39.8	ALL	P	SUR	766	1	0	1.1	0.0	1.1
44743	45.4	-50.2	ALL	P	SUR	650	5	1	1.8	0.2	1.9
44763	51.3	-36.1	ALL	P	SUR	280	3	1	1.7	-0.2	1.7
44765	57.5	-47.2	ALL	P	SUR	800	3	0	1.2	0.1	1.2
44768	59.1	-18.7	ALL	P	SUR	1407	4	0	0.9	0.3	0.9
44771	53.8	-19.4	ALL	P	SUR	1085	1	0	1.3	-0.1	1.3
44773	57.0	-17.0	ALL	P	SUR	1337	1	0	1.0	0.1	1.1
44774	49.7	-47.1	ALL	P	SUR	853	2	0	1.6	-1.0	1.9
44775	61.7	-29.7	ALL	P	SUR	593	63	11	5.6	-0.6	5.7
44776	47.6	-46.1	ALL	P	SUR	641	0	0	1.1	-0.2	1.1
44778	58.9	-56.0	ALL	P	SUR	1371	1	0	1.1	-0.2	1.1
44779	41.4	-50.4	ALL	P	SUR	646	2	0	1.2	-0.2	1.2
44780	58.0	-20.3	ALL	P	SUR	1360	6	0	1.1	0.2	1.1
44901	55.9	-44.6	ALL	P	SUR	140	0	0	1.2	0.7	1.4
44912	52.4	-24.3	ALL	P	SUR	104	0	0	1.7	0.5	1.7
44925	57.3	-56.9	ALL	P	SUR	175	0	0	1.2	0.8	1.4
47857	46.1	-73.1	ALL	P	SUR	1	0	0	0.0	-0.3	0.3
48518	77.4	-13.6	ALL	P	SUR	676	0	0	0.8	0.0	0.8
51633	40.9	-59.4	ALL	P	SUR	190	0	0	1.0	-0.2	1.0

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE											
62501	45.6	-11.5	ALL	P	SUR	59	0	0	1.0	-0.5	1.1
62506	47.3	-12.7	ALL	P	SUR	347	0	0	0.9	0.0	0.9
62508	46.0	-7.1	ALL	P	SUR	149	0	0	0.9	-0.1	0.9
62509	46.3	-5.5	ALL	P	SUR	308	0	0	0.8	0.0	0.8
62510	46.8	-5.9	ALL	P	SUR	304	0	0	0.9	0.3	0.9
62551	45.6	-11.7	ALL	P	SUR	561	0	0	0.9	0.3	0.9
62553	53.1	-16.8	ALL	P	SUR	741	3	0	1.3	-0.1	1.3
62557	44.7	-6.7	ALL	P	SUR	924	3	0	0.9	0.2	0.9
62558	56.8	-8.0	ALL	P	SUR	63	0	0	0.9	0.1	0.9
62673	63.6	-17.6	ALL	P	SUR	464	0	0	0.8	0.0	0.8
62674	62.5	-19.2	ALL	P	SUR	448	0	0	0.8	0.1	0.8
62751	45.4	-19.2	ALL	P	SUR	48	0	0	1.7	0.3	1.7
62758	45.9	-25.3	ALL	P	SUR	167	0	0	1.2	0.0	1.2
63666	76.3	-6.2	ALL	P	SUR	197	0	0	1.0	0.1	1.0
64528	59.3	-22.0	ALL	P	SUR	993	2	0	0.9	-0.2	1.0
64529	62.7	-30.2	ALL	P	SUR	1344	2	0	0.9	-0.2	0.9
64530	61.8	-58.2	ALL	P	SUR	1204	4	0	1.3	0.2	1.3
64552	61.0	-41.0	ALL	P	SUR	1	0	0	0.0	0.0	0.0
64561	51.8	-15.0	ALL	P	SUR	834	9	1	1.2	0.2	1.2
64563	60.4	-32.3	ALL	P	SUR	1865	3	0	0.9	0.0	0.9
65562	60.8	-18.8	ALL	P	SUR	1892	2	0	0.9	-0.1	0.9
65571	62.5	-31.2	ALL	P	SUR	1562	12	1	0.8	0.2	0.8
65591	65.3	-29.5	ALL	P	SUR	1030	3	0	0.9	0.2	0.9
65592	62.9	-23.2	ALL	P	SUR	1488	7	0	0.8	0.0	0.8
65594	64.5	-38.5	ALL	P	SUR	1727	2	0	0.9	0.2	0.9
65597	54.8	-24.0	ALL	P	SUR	1437	10	1	1.3	-0.3	1.3
WIND SPEED											
13502	15.8	-39.1	ALL	SPEED	SUR	202	0	0	1.6	1.3	2.1
13503	20.7	-35.3	ALL	SPEED	SUR	246	0	0	1.2	-0.5	1.3
41501	20.7	-43.0	ALL	SPEED	SUR	212	1	0	1.9	-0.3	2.0
41502	20.8	-42.6	ALL	SPEED	SUR	247	0	0	1.8	-0.7	1.9
41503	15.3	-52.0	ALL	SPEED	SUR	2	0	0	0.0	-6.2	6.2
41520	17.5	-42.8	ALL	SPEED	SUR	201	0	0	1.6	1.0	1.9
41521	21.6	-53.9	ALL	SPEED	SUR	310	0	0	1.3	0.1	1.3
41523	16.2	-57.2	ALL	SPEED	SUR	220	0	0	1.2	-0.8	1.4
41524	17.9	-62.9	ALL	SPEED	SUR	13	0	0	1.8	1.9	2.6
42534	45.2	-42.3	ALL	SPEED	SUR	11	0	0	1.9	-1.6	2.5
44601	52.9	-48.4	ALL	SPEED	SUR	512	0	0	2.1	1.3	2.4
44602	52.8	-39.5	ALL	SPEED	SUR	446	0	0	2.3	0.6	2.4
44609	58.4	-22.4	ALL	SPEED	SUR	1341	0	0	3.6	0.9	3.7
44613	40.2	-35.4	ALL	SPEED	SUR	2	0	0	5.6	36.0	36.4
44621	57.1	-13.2	ALL	SPEED	SUR	555	1	0	2.7	-0.5	2.7
44773	57.0	-17.0	ALL	SPEED	SUR	1912	1	0	2.2	-3.7	4.3
44774	49.7	-47.1	ALL	SPEED	SUR	1	0	0	0.0	1.3	1.3
62502	46.0	-6.9	ALL	SPEED	SUR	547	0	0	1.4	0.1	1.4
62551	45.6	-11.7	ALL	SPEED	SUR	453	0	0	1.7	0.3	1.8
62553	53.1	-16.8	ALL	SPEED	SUR	962	0	0	1.9	-1.2	2.2
62559	46.4	-6.8	ALL	SPEED	SUR	115	0	0	2.1	-0.3	2.1
62560	45.5	-6.2	ALL	SPEED	SUR	613	0	0	1.5	-0.6	1.6
62561	44.7	-6.7	ALL	SPEED	SUR	512	0	0	1.4	0.3	1.5
62562	46.3	-5.5	ALL	SPEED	SUR	384	0	0	1.7	-0.2	1.7
62563	44.8	-8.0	ALL	SPEED	SUR	710	0	0	1.7	0.0	1.7
62564	47.1	-5.9	ALL	SPEED	SUR	314	0	0	1.7	-0.2	1.7
62567	43.5	-11.7	ALL	SPEED	SUR	125	0	0	1.5	-0.5	1.6
62568	44.8	-7.8	ALL	SPEED	SUR	650	0	0	1.6	-0.3	1.6
62673	63.6	-17.6	ALL	SPEED	SUR	2	0	0	0.0	-5.2	5.2
62674	62.5	-19.2	ALL	SPEED	SUR	742	0	0	1.9	0.1	1.9

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
WIND SPEED											
62751	45.4	-19.2	ALL	SPEED	SUR	183	0	0	1.3	-0.5	1.4
62752	45.8	-5.5	ALL	SPEED	SUR	592	0	0	1.3	-0.3	1.4
62753	42.0	-19.7	ALL	SPEED	SUR	152	0	0	2.2	0.5	2.3
62754	48.3	-14.1	ALL	SPEED	SUR	168	0	0	1.5	-0.1	1.5
62756	44.5	-3.8	ALL	SPEED	SUR	47	0	0	0.0	1.3	1.3
62758	45.9	-25.3	ALL	SPEED	SUR	661	0	0	1.8	-0.3	1.8
62759	41.0	-14.5	ALL	SPEED	SUR	137	0	0	1.4	0.2	1.4
62760	48.6	-11.9	ALL	SPEED	SUR	191	0	0	1.4	-0.3	1.4
65562	60.8	-18.8	ALL	SPEED	SUR	1	1	100	0.0	0.0	0.0
65594	64.5	-38.5	ALL	SPEED	SUR	1	0	0	0.0	2.1	2.1
WIND DIRECTION											
13502	15.8	-39.1	ALL	DIRN.	SUR	203	0	0	18.7	-12.1	22.3
13503	20.7	-35.3	ALL	DIRN.	SUR	206	0	0	14.1	-0.9	14.2
41501	20.7	-43.0	ALL	DIRN.	SUR	130	1	1	20.8	-0.8	20.8
41502	20.8	-42.6	ALL	DIRN.	SUR	115	0	0	15.0	5.6	16.0
41503	15.3	-52.0	ALL	DIRN.	SUR	207	0	0	14.5	14.7	20.6
41520	17.5	-42.8	ALL	DIRN.	SUR	190	0	0	16.1	-3.5	16.5
41521	21.6	-53.9	ALL	DIRN.	SUR	155	0	0	28.0	9.6	29.6
41523	16.2	-57.2	ALL	DIRN.	SUR	154	0	0	12.4	2.4	12.6
42534	45.2	-42.3	ALL	DIRN.	SUR	9	0	0	57.5	-11.4	58.7
44601	52.9	-48.4	ALL	DIRN.	SUR	250	0	0	29.7	5.8	30.2
44602	52.8	-39.5	ALL	DIRN.	SUR	244	0	0	25.5	0.0	25.5
44609	58.4	-22.4	ALL	DIRN.	SUR	584	0	0	17.7	0.0	17.7
44621	57.1	-13.2	ALL	DIRN.	SUR	690	1	0	25.2	-6.6	26.1
44773	57.0	-17.0	ALL	DIRN.	SUR	537	1	0	22.6	-5.6	23.2
62502	46.0	-6.9	ALL	DIRN.	SUR	237	0	0	14.9	10.1	18.0
62551	45.6	-11.7	ALL	DIRN.	SUR	182	0	0	22.4	-4.5	22.8
62553	53.1	-16.8	ALL	DIRN.	SUR	514	0	0	15.6	-5.5	16.6
62559	46.4	-6.8	ALL	DIRN.	SUR	67	0	0	18.5	-23.2	29.7
62560	45.5	-6.2	ALL	DIRN.	SUR	181	0	0	15.9	10.5	19.1
62561	44.7	-6.7	ALL	DIRN.	SUR	165	0	0	16.9	9.1	19.2
62562	46.3	-5.5	ALL	DIRN.	SUR	118	0	0	16.3	10.6	19.5
62563	44.8	-8.0	ALL	DIRN.	SUR	196	0	0	20.9	-8.5	22.5
62564	47.1	-5.9	ALL	DIRN.	SUR	100	0	0	13.5	4.6	14.2
62567	43.5	-11.7	ALL	DIRN.	SUR	30	0	0	14.8	3.8	15.3
62568	44.8	-7.8	ALL	DIRN.	SUR	165	0	0	17.7	8.7	19.7
62674	62.5	-19.2	ALL	DIRN.	SUR	147	0	0	12.0	-7.1	14.0
62751	45.4	-19.2	ALL	DIRN.	SUR	90	0	0	16.5	-4.2	17.0
62752	45.8	-5.5	ALL	DIRN.	SUR	201	0	0	14.3	2.6	14.5
62753	42.0	-19.7	ALL	DIRN.	SUR	74	0	0	19.4	5.5	20.2
62754	48.3	-14.1	ALL	DIRN.	SUR	118	0	0	13.6	5.7	14.8
62758	45.9	-25.3	ALL	DIRN.	SUR	302	0	0	19.5	-7.8	21.0
62759	41.0	-14.5	ALL	DIRN.	SUR	74	0	0	17.0	1.5	17.1
62760	48.6	-11.9	ALL	DIRN.	SUR	123	0	0	18.7	8.6	20.5
65562	60.8	-18.8	ALL	DIRN.	SUR	1	1	100	0.0	0.0	0.0
65594	64.5	-38.5	ALL	DIRN.	SUR	1	0	0	0.0	14.4	14.4

TABLE 9

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: June 1998

Monitoring procedures:

Period		:One calendar month.
Data monitored		:Statistics for each airline carrier.
Area monitored		:40°N - 70°N, 60°W - 0°W.
Standard of comparison		:Background field from Bracknell global model.
Observation times		:All hours combined.
Level(s) monitored		:300.0 - 150.0 hPa
Elements monitored		:TEMP in °C ; WIND in m s^{-1}
Parameters monitored	:N REP.	:Number of observations received excluding duplicates.
	:PG	:Percentage of observations with gross errors.
	:PR	:Percentage of observations rejected by quality control including rejections from the duplicate check.
	:PC	:Percentage of observations with calm winds.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors in Temperature & vector wind.
GROSS ERROR LIMITS	:10.0 °C ; 60 m s^{-1} Vector Wind	
SELECTION CRITERIA	:N REP $\geq$ 20	

NB: US ACARs and ADS data are shown at the bottom of the table as US ACAR and ADS respectively.

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAL	3562	1	29	1.9	-0.2	2640	0	15	0	7.2	0.9
ACA	1766	1	13	1.9	-0.1	1565	0	6	0	6.5	0.5
AEA	284	0	33	2.3	0.8	255	0	31	0	8.6	0.2
AEL	331	0	24	1.8	-0.8	346	1	24	1	8.8	0.5
AEY	21	0	10	2.1	1.1	23	0	4	0	5.6	0.7
AFL	333	1	15	1.8	0.2	293	1	9	0	6.8	0.6
AFR	849	1	14	1.6	0.0	849	0	14	0	7.8	0.9
AIH	152	3	13	2.1	0.2	148	1	6	0	7.6	1.0
AJM	34	0	9	2.2	-0.5	33	0	9	0	9.1	1.1
AMT	34	0	56	2.7	1.8	33	0	27	0	14.8	0.1
AMX	185	1	5	1.8	0.1	186	0	5	0	8.9	1.0
ANZ	190	2	7	2.0	-1.1	183	0	4	0	5.0	-0.1
AOM	298	2	6	1.6	1.0	297	0	5	0	8.7	1.5
AUA	40	0	30	2.2	-0.5	29	0	17	0	5.2	1.1
AVA	131	0	2	1.6	0.1	138	1	7	0	9.4	1.0
AZA	330	1	25	2.0	0.1	279	0	19	0	9.3	1.0
BAL	567	1	23	1.8	-0.5	576	0	23	0	7.7	0.5
BAW	1405	0	22	2.1	-0.2	1210	1	17	0	7.1	0.9
BBB	32	0	0	1.7	-0.4	31	0	26	0	10.9	-1.2
BWA	129	0	22	1.8	0.3	109	1	17	0	8.1	1.2
CDN	789	0	13	1.9	0.2	713	0	7	0	6.3	0.7
CFC	30	0	20	2.2	0.4	30	0	23	0	8.9	4.8
CFG	630	0	8	1.9	-1.1	601	0	5	0	8.2	1.2
CKS	81	0	7	2.2	1.5	82	0	9	0	11.6	0.6
CKT	82	0	22	1.4	0.5	75	1	17	0	9.6	1.3
CLX	324	0	7	2.0	-0.8	308	0	5	0	7.1	0.2
CMM	409	1	13	1.7	0.1	358	1	7	0	5.7	0.4
COA	935	1	26	1.9	0.2	748	0	19	0	12.2	1.8
CRL	198	1	4	1.7	0.7	203	0	4	0	8.2	0.4
CTB	267	0	3	1.9	-0.5	268	0	5	0	7.3	0.8
CTM	34	0	18	1.9	-0.7	34	0	18	0	5.9	1.5
CUB	254	2	9	2.0	0.8	252	0	57	1	9.8	1.9
DAL	3099	1	32	2.1	-0.4	2243	0	20	0	7.3	0.8
DBY	246	0	3	1.8	-1.0	251	0	3	0	8.9	0.3
DHL	205	6	67	5.0	-2.9	151	0	21	0	10.3	1.6
DLH	2446	1	19	2.0	0.0	2076	0	13	0	6.9	0.8
EIA	27	0	19	1.5	0.2	27	0	19	0	13.0	4.5
EIN	38	0	0	2.1	0.5	40	0	3	0	7.7	0.6
ELY	143	1	14	1.5	-0.2	132	0	8	0	8.0	1.6
EWW	110	1	19	2.7	0.6	101	0	100	1	12.3	2.1
FDX	192	1	28	1.6	0.4	149	0	16	0	8.2	0.8
FIN	532	1	26	2.1	0.2	398	1	14	0	5.7	0.2
GAF	172	0	31	2.3	-0.2	120	0	15	0	6.4	1.1
GRL	26	0	0	1.4	0.3	26	0	0	0	5.1	-1.5
HLF	60	2	25	1.3	-0.6	55	0	15	0	6.1	1.0
IBE	1001	1	30	2.2	0.8	872	0	25	0	9.2	1.0
ICE	855	1	29	1.9	0.1	624	0	18	0	6.7	0.8
IRL	36	0	28	2.2	1.2	27	0	11	0	5.0	0.6
JKK	194	0	27	1.7	0.0	150	0	21	0	9.0	1.2
KLM	2493	0	28	1.8	-0.1	2328	0	26	0	7.7	1.0
LDA	141	0	25	1.8	-1.2	128	0	23	0	7.9	-0.2
LDI	199	1	31	1.7	-0.9	183	0	26	0	8.1	0.6
LEI	123	0	11	1.9	0.3	114	0	8	0	7.7	0.9
LIB	99	0	2	1.7	1.0	104	0	3	0	6.9	0.7
LOT	177	1	27	2.4	-1.1	131	0	17	0	8.4	2.1
LTU	615	0	26	1.8	-0.3	523	0	16	0	6.9	1.1
MAH	24	0	8	1.8	-0.9	24	0	8	0	7.1	1.5
MAS	73	1	16	2.1	0.1	68	3	15	0	10.1	-0.2
MON	117	0	14	1.5	0.1	112	0	11	0	6.4	1.0

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
MPD	60	2	13	2.2	0.8	58	0	9	0	7.9	0.0
MPH	685	0	8	1.9	-0.7	645	0	5	0	6.8	0.8
NWA	3499	0	12	1.9	0.7	3114	0	7	0	7.3	0.8
PAC	113	0	15	1.8	0.1	99	1	11	0	8.5	0.6
RAM	58	3	10	2.1	-0.5	57	0	39	0	8.1	1.6
RCH	203	1	20	2.8	0.3	181	1	17	0	12.4	1.8
ROY	305	2	21	2.2	-0.5	258	0	10	0	8.3	1.3
RRR	172	2	20	2.0	-0.1	165	1	19	1	8.0	0.7
SAB	74	0	18	1.9	0.1	61	0	10	0	7.3	2.8
SAS	1143	0	2	1.7	-0.2	1147	0	3	0	7.1	0.2
SIA	125	1	4	1.7	-0.8	122	0	4	0	7.7	0.5
SLR	79	0	23	1.3	-0.9	80	0	25	0	7.7	-0.7
SVA	79	1	8	1.8	-0.5	93	0	5	0	7.2	-0.2
SWR	167	0	28	1.9	0.4	130	0	15	0	7.5	1.5
TAP	338	1	4	1.7	-0.5	332	0	5	0	9.3	0.9
TOW	125	5	34	2.9	0.4	95	0	19	0	7.7	2.1
TSC	155	1	20	2.3	0.5	129	0	10	0	7.0	1.6
TWA	1487	1	34	2.0	0.0	1066	0	21	0	7.5	1.0
UAL	2112	1	19	2.0	-0.2	1785	0	10	0	6.3	0.5
UPS	368	1	32	1.8	0.4	310	0	28	0	8.7	0.7
USA	365	2	36	1.9	-0.3	254	0	25	0	7.2	1.5
VIR	339	1	11	1.9	-0.4	308	0	6	0	6.7	1.7
VKG	47	0	9	2.1	0.1	45	0	7	0	9.3	2.6
WOA	64	0	17	2.4	0.6	56	0	13	0	6.8	1.5
BA	5371	0	1	1.4	0.2	5371	0	5	0	6.0	0.9
KL	3503	7	9	1.7	1.0	3501	0	24	0	10.0	1.5
LH	692	0	0	1.6	0.8	692	0	0	0	5.6	1.0
SV	74	51	54	2.5	1.7	74	0	0	0	9.1	-1.5
N	442	1	12	2.5	0.5	412	0	8	1	8.0	0.9
ADS	70	0	3	1.3	-0.2	70	0	3	0	4.0	0.3
US ACARS	13308	0	2	1.5	0.3	13306	0	4	0	6.1	0.7

TABLE 10

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: June 1998

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from Bracknell global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:100 hPa.
Element monitored		:GEOPOTENTIAL HEIGHT in metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.1

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
DBBH	00	Z	100	1	0	0.0	51.0	51.0
DBBH	12	Z	100	21	0	23.0	25.1	-10.0
DBLK	12	Z	100	15	0	17.1	17.1	1.4
ELML7	00	Z	100	10	0	37.5	38.5	9.1
ELML7	12	Z	100	15	0	13.6	16.1	8.7
FNOR	00	Z	100	11	0	11.0	17.2	13.3
FNOR	12	Z	100	9	0	10.6	12.6	6.7
FNOU	00	Z	100	8	0	16.8	18.6	8.1
FNOU	12	Z	100	7	0	7.2	9.6	-6.3
FNPH	00	Z	100	10	0	11.9	12.8	4.9
FNPH	12	Z	100	12	0	10.8	12.7	-6.6
FNRS	00	Z	100	12	0	10.4	11.6	5.2
FNRS	12	Z	100	12	0	11.6	11.6	-1.0
JBOA	00	Z	100	1	0	0.0	1.0	1.0
JCCX	00	Z	100	1	0	0.0	14.0	14.0
JDWX	00	Z	100	1	0	0.0	14.0	14.0
JNSR	00	Z	100	1	0	0.0	21.0	21.0
LDWR	00	Z	100	26	0	8.4	13.0	10.0
LDWR	12	Z	100	27	0	14.2	14.4	-2.4
OVYA2	00	Z	100	11	0	14.7	15.2	3.8
OVYA2	12	Z	100	10	0	19.8	19.8	-0.1
OXYH2	00	Z	100	16	1	14.3	22.0	-16.8
OXYH2	12	Z	100	18	0	19.7	26.4	-17.6
SHIPS	00	Z	100	1	0	0.0	38.0	38.0
THNOG	00	Z	100	1	0	0.0	15.0	15.0
TRAC98	00	Z	100	1	0	0.0	9.0	9.0
TRAC98	12	Z	100	9	0	16.6	24.2	17.6
TRA98	00	Z	100	1	0	0.0	7.0	-7.0
UCKZ	00	Z	100	3	0	18.7	25.7	17.7
UUAA	00	Z	100	1	0	0.0	10.0	10.0
V2VM	00	Z	100	2	0	8.0	8.2	-2.0
V2VM	12	Z	100	2	0	4.0	24.3	-24.0
V2XM	00	Z	100	10	0	14.5	26.4	-22.1
V2XM	12	Z	100	5	0	6.9	36.8	-36.2
WTEC	00	Z	100	16	0	16.1	16.4	3.4
WTEC	12	Z	100	19	0	34.1	34.7	-6.6
XXBA	12	Z	100	1	0	0.0	57.0	57.0
03953	00	Z	100	27	0	11.6	20.0	16.3
03953	12	Z	100	30	0	13.8	13.9	2.2
04018	00	Z	100	16	0	17.2	21.8	13.3
04018	12	Z	100	20	0	12.2	14.1	7.0
04220	00	Z	100	10	0	12.9	20.6	16.0
04220	12	Z	100	3	0	14.2	18.6	12.0
04270	00	Z	100	28	0	13.3	13.6	-2.5
04270	12	Z	100	28	0	10.4	14.1	-9.5
04339	00	Z	100	19	0	16.8	21.3	13.1
04339	12	Z	100	19	0	12.3	13.2	4.7
04360	00	Z	100	29	0	11.2	18.4	14.6
04360	12	Z	100	30	0	11.3	15.0	9.9
08001	00	Z	100	14	0	10.2	10.9	3.8
08001	12	Z	100	24	0	12.8	14.9	-7.7
08508	00	Z	100	1	0	0.0	5.0	5.0
08508	12	Z	100	18	0	12.2	15.4	-9.4
08522	00	Z	100	1	0	0.0	17.0	17.0
08522	12	Z	100	13	0	13.3	15.4	-7.7
08594	00	Z	100	1	0	0.0	50.0	50.0
08594	12	Z	100	3	0	2.1	3.4	-2.7
60020	00	Z	100	25	0	0.0	0.0	0.0
60020	12	Z	100	30	0	4.8	4.9	-0.9
71600	00	Z	100	28	0	18.3	21.9	12.1

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
71600	12	Z	100	30	0	9.3	10.1	4.1
72201	00	Z	100	26	0	18.0	52.5	49.4
72201	12	Z	100	27	1	21.6	42.5	36.7
72402	00	Z	100	24	0	12.9	31.7	29.0
72402	12	Z	100	28	0	15.1	35.9	32.5
74494	00	Z	100	25	0	24.4	24.4	-1.0
74494	12	Z	100	27	0	39.5	43.5	18.1
78016	00	Z	100	25	0	14.4	15.0	4.1
78016	12	Z	100	24	0	14.2	14.4	2.7

TABLE 11

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: June 1998

Monitoring procedures:

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from Bracknell global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:500 hPa.
Element monitored		:GEOPOTENTIAL HEIGHT in metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.1

```
 WMO   OBS               NUM    NUM
IDENT TIME ELM  LEV     OBS   GROSS     SD    RMS   BIAS

CGDX   00   Z   500      1      0      0.0   15.0   15.0
DBBH   00   Z   500      1      0      0.0   16.0   16.0
DBBH   12   Z   500     22      0     19.0   19.2    2.4
DBLK   12   Z   500     15      0     13.8   15.1    6.2
ELML7  00   Z   500     14      0     12.7   15.5    9.0

ELML7  12   Z   500     16      0      9.2   12.7    8.7
FNOR   00   Z   500     12      0     10.2   13.6    9.1
FNOR   12   Z   500     10      0      8.9    9.1    2.0
FNOU   00   Z   500      8      0     10.8   14.8   10.1
FNOU   12   Z   500      7      0      7.5   10.5    7.4

FNPH   00   Z   500     11      0      8.2   10.2    6.2
FNPH   12   Z   500     13      0      8.1    9.7    5.3
FNRS   00   Z   500     13      0      8.0   12.2    9.2
FNRS   12   Z   500     13      0      6.0    8.2    5.7
JBOA   00   Z   500      1      0      0.0    1.0    1.0

JCCX   00   Z   500      1      0      0.0    3.0    3.0
JDWX   00   Z   500      1      0      0.0    5.0    5.0
JNSR   00   Z   500      1      0      0.0   14.0   14.0
LDWR   00   Z   500     27      0      8.4    8.5    1.7
LDWR   12   Z   500     27      0      8.8    9.9   -4.5

OVYA2  00   Z   500     12      0     10.6   11.7   -5.0
OVYA2  12   Z   500     10      0     14.7   17.2   -8.9
OXYH2  00   Z   500     16      1     12.0   25.3  -22.3
OXYH2  12   Z   500     18      0     11.1   26.2  -23.8
SHIPS  00   Z   500      2      0      5.5    6.0   -2.5

SHIPS  12   Z   500      1      0      0.0    3.0   -3.0
THNOG  00   Z   500      1      0      0.0   14.0  -14.0
TRAC98 00   Z   500      1      0      0.0   12.0  -12.0
TRAC98 12   Z   500     10      0      7.1    7.3    1.7
TRA98  00   Z   500      1      0      0.0    7.0   -7.0

UCKZ   00   Z   500      3      0     16.4   19.5   10.7
UUAA   00   Z   500      1      0      0.0    6.0    6.0
V2VM   00   Z   500      2      0      2.0    3.6    3.0
V2VM   12   Z   500      2      0      5.0    5.0    0.0
V2XM   00   Z   500     11      0     14.5   17.3   -9.5

V2XM   12   Z   500      5      0     12.5   21.6  -17.6
WTEC   00   Z   500     22      0     11.5   15.7   10.7
WTEC   12   Z   500     21      0     14.1   15.3    6.0
XXBA   12   Z   500      2      0      9.0   10.3    5.0
03953  00   Z   500     29      0     10.4   15.7   11.7

03953  12   Z   500     30      0     13.4   13.4    0.1
04018  00   Z   500     29      0      9.8   11.7    6.3
04018  12   Z   500     30      0     12.5   12.7    2.3
04220  00   Z   500     28      0     13.4   17.3   11.0
04220  12   Z   500     29      0     12.4   15.6    9.4

04270  00   Z   500     29      0     13.4   14.7   -6.2
04270  12   Z   500     28      0     11.5   14.7   -9.1
04339  00   Z   500     29      0      8.0   12.2    9.2
04339  12   Z   500     29      0      5.9    9.6    7.6
04360  00   Z   500     29      0      8.6   11.6    7.7

04360  12   Z   500     30      0     10.0   10.7    3.9
08001  00   Z   500     26      0     10.9   12.6    6.2
08001  12   Z   500     25      0     10.8   10.9   -1.6
08508  00   Z   500      1      0      0.0   13.0   13.0
08508  12   Z   500     29      0      9.1    9.1   -1.1

08522  00   Z   500      1      0      0.0    5.0    5.0
08522  12   Z   500     13      0     11.0   11.0   -0.6
08594  00   Z   500      1      0      0.0   19.0   19.0
08594  12   Z   500      3      0      9.4   11.2    6.0
60020  00   Z   500     28      0     13.5   13.8    2.8
```

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
60020	12	Z	500	30	0	14.6	15.3	-4.6
71600	00	Z	500	28	0	12.1	12.9	4.4
71600	12	Z	500	30	0	9.7	10.0	2.5
72201	00	Z	500	26	0	8.3	19.5	17.6
72201	12	Z	500	28	0	19.2	21.5	9.7
72402	00	Z	500	25	0	15.6	16.7	6.0
72402	12	Z	500	28	0	9.8	11.1	5.2
74494	00	Z	500	28	0	16.9	17.3	-3.5
74494	12	Z	500	30	0	20.4	21.2	5.8
78016	00	Z	500	26	0	10.4	16.5	12.8
78016	12	Z	500	24	0	6.6	15.3	13.8

TABLE 12

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: June 1998

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from Bracknell global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:100 hPa.
Element monitored		:VECTOR WIND in m s^{-1}
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:UBIAS,VBIAS	:Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.2

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
DBBH	00	V	100	1	0	0	0.0	9.1	-1.4
DBBH	12	V	100	17	0	0	0.0	-0.2	1.2
DBLK	12	V	100	13	0	0	4.7	2.0	-0.5
ELML7	00	V	100	10	0	0	3.5	0.3	1.2
ELML7	12	V	100	14	0	0	3.2	1.0	0.1
FNOR	00	V	100	8	0	0	4.4	0.5	-1.3
FNOR	12	V	100	7	0	0	4.4	1.1	0.4
FNOU	00	V	100	7	0	0	4.4	0.9	2.0
FNOU	12	V	100	7	0	0	4.4	1.3	-0.9
FNPH	00	V	100	4	0	0	4.4	-0.6	-1.9
FNPH	12	V	100	8	0	0	4.4	2.6	-0.1
FNRS	00	V	100	10	0	0	4.4	0.9	1.2
FNRS	12	V	100	11	0	0	2.9	-0.3	0.0
JBOA	00	V	100	1	0	0	2.6	0.5	-0.8
JCCX	00	V	100	1	0	0	2.6	1.2	-0.4
JDWX	00	V	100	1	0	0	2.6	1.3	-2.3
JNSR	00	V	100	1	0	0	2.5	-0.9	0.5
LDWR	00	V	100	26	0	0	2.5	0.3	0.0
LDWR	12	V	100	27	0	0	1.7	-0.1	0.2
OVYA2	00	V	100	10	0	0	1.2	-1.2	0.5
OVYA2	12	V	100	10	0	0	2.6	-0.8	0.2
OXYH2	00	V	100	14	0	0	1.4	-0.4	0.0
OXYH2	12	V	100	14	0	0	3.5	-1.0	0.9
SHIPS	00	V	100	1	0	0	4.4	2.8	-5.0
THNOG	00	V	100	1	0	0	4.4	-1.6	-0.6
TRAC98	00	V	100	1	0	0	4.3	-2.3	2.3
TRAC98	12	V	100	9	0	0	4.3	0.8	0.6
TRA98	00	V	100	1	0	0	1.8	-0.6	-1.4
UUAA	00	V	100	1	0	0	1.8	-4.3	-1.2
V2VM	00	V	100	1	0	0	1.8	-0.4	1.2
V2VM	12	V	100	2	0	0	1.8	-1.1	0.6
V2XM	00	V	100	9	0	0	1.8	0.4	-0.1
V2XM	12	V	100	5	0	0	1.8	-0.9	0.9
03953	00	V	100	26	0	0	1.8	-0.7	1.3
03953	12	V	100	29	0	0	2.3	0.1	1.1
04018	00	V	100	6	0	0	2.1	-1.4	-1.9
04018	12	V	100	3	0	33	2.1	-5.3	3.7
04220	00	V	100	4	0	0	2.1	-0.4	0.7
04220	12	V	100	1	0	0	2.1	-3.1	0.6
04270	00	V	100	27	0	0	2.1	-1.1	0.8
04270	12	V	100	24	0	0	2.2	-1.2	0.5
04339	00	V	100	17	0	5	2.0	-0.2	-0.7
04339	12	V	100	19	0	0	4.4	-0.8	0.0
04360	00	V	100	28	0	0	3.3	-0.7	0.5
04360	12	V	100	29	0	0	1.8	-1.4	0.9
08001	00	V	100	13	0	0	7.3	0.6	1.1
08001	12	V	100	17	0	0	4.1	0.3	0.9
08508	00	V	100	1	0	0	2.9	0.3	-3.3
08508	12	V	100	15	1	6	2.9	2.1	-4.5
60020	00	V	100	24	0	0	3.8	0.0	-0.1
60020	12	V	100	29	0	0	4.7	-0.1	-1.9
71600	00	V	100	28	0	0	2.1	-0.2	0.4
71600	12	V	100	30	0	3	2.8	0.5	0.4
72201	00	V	100	26	0	0	1.4	-0.5	-0.3
72201	12	V	100	28	0	0	3.3	-0.2	0.3
72402	00	V	100	24	0	0	2.9	-2.9	0.3
72402	12	V	100	28	0	0	3.8	-1.6	0.9
74494	00	V	100	23	0	0	5.1	-0.9	0.2
74494	12	V	100	26	0	0	2.5	0.2	0.5
78016	00	V	100	25	0	0	5.0	-1.7	1.0
78016	12	V	100	23	0	0	2.6	1.2	1.2

TABLE 13

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: June 1998

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from Bracknell global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:500 hPa.
Element monitored		:VECTOR WIND in m s^{-1}
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:UBIAS,VBIAS:	Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.2

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
CGDX	00	V	500	1	0	0	0.0	0.1	1.5
DBBH	00	V	500	1	0	0	5.2	0.5	3.5
DBBH	12	V	500	18	0	0	5.2	0.9	-0.2
DBLK	12	V	500	13	0	0	3.7	-0.7	-1.2
ELML7	00	V	500	13	0	0	2.4	0.3	0.2
ELML7	12	V	500	12	0	0	2.9	0.8	0.7
FNOR	00	V	500	9	0	0	2.2	-0.2	-1.1
FNOR	12	V	500	10	0	10	2.2	-0.6	0.9
FNOU	00	V	500	8	0	0	2.7	0.0	-1.1
FNOU	12	V	500	7	0	0	2.7	-0.4	1.4
FNPH	00	V	500	7	0	0	2.7	-0.5	1.0
FNPH	12	V	500	10	0	0	2.7	0.6	0.7
FNRS	00	V	500	13	0	0	2.8	-0.9	-0.3
FNRS	12	V	500	12	0	0	3.0	-0.5	1.6
JBOA	00	V	500	1	0	0	3.8	0.9	0.1
JDWX	00	V	500	1	0	0	3.8	0.4	-2.5
LDWR	00	V	500	27	0	0	3.2	-0.5	-0.1
LDWR	12	V	500	27	0	0	1.9	0.1	-0.3
OVYA2	00	V	500	12	0	0	3.0	0.2	0.1
OVYA2	12	V	500	10	0	10	2.9	1.6	-1.2
OXYH2	00	V	500	17	0	0	6.4	0.4	0.7
OXYH2	12	V	500	16	0	0	4.0	0.3	1.3
SHIPS	00	V	500	2	0	0	4.4	-2.3	-3.0
SHIPS	12	V	500	1	0	0	4.4	7.1	-5.5
THNOG	00	V	500	1	0	0	4.4	-0.3	0.0
TRAC98	00	V	500	1	0	0	2.0	2.5	1.7
TRAC98	12	V	500	10	0	0	2.0	0.4	-0.9
TRA98	00	V	500	1	0	0	2.2	0.8	-4.4
UUAA	00	V	500	1	0	0	2.2	-2.3	-1.2
V2VM	00	V	500	2	0	0	2.2	0.4	-0.3
V2VM	12	V	500	2	0	0	2.2	-1.0	1.8
V2XM	00	V	500	11	0	0	2.2	1.2	0.2
V2XM	12	V	500	5	0	0	3.5	-0.6	-1.4
03953	00	V	500	29	0	0	2.2	1.3	0.0
03953	12	V	500	29	0	0	4.6	0.5	0.8
04018	00	V	500	21	0	9	3.3	3.0	0.6
04018	12	V	500	13	0	7	6.6	2.8	-0.2
04220	00	V	500	24	0	0	5.3	0.3	0.8
04220	12	V	500	25	0	0	3.7	-1.8	1.1
04270	00	V	500	27	0	0	4.0	-1.0	0.9
04270	12	V	500	27	0	0	2.3	-0.3	1.1
04339	00	V	500	29	0	0	2.5	-2.1	-1.8
04339	12	V	500	29	0	0	3.4	0.5	-1.6
04360	00	V	500	29	0	0	3.2	-0.9	0.5
04360	12	V	500	29	0	0	2.7	-0.3	1.1
08001	00	V	500	24	0	0	2.8	0.0	0.0
08001	12	V	500	20	0	0	3.1	-1.0	0.2
08508	00	V	500	1	0	0	2.8	-0.6	0.3
08508	12	V	500	28	0	0	2.8	-0.4	0.2
60020	00	V	500	26	0	0	2.8	1.1	-0.2
60020	12	V	500	29	0	3	3.8	0.3	-2.2
71600	00	V	500	28	0	0	3.2	1.0	0.4
71600	12	V	500	30	0	0	2.8	0.8	-0.2
72201	00	V	500	26	0	0	3.6	1.1	-1.6
72201	12	V	500	28	0	0	2.7	0.1	-1.3
72402	00	V	500	25	0	0	2.8	1.1	0.6
72402	12	V	500	28	0	0	3.5	0.7	1.2
74494	00	V	500	28	0	0	3.7	0.4	0.7
74494	12	V	500	29	0	0	2.7	1.1	0.3
78016	00	V	500	25	0	0	3.5	0.1	0.4
78016	12	V	500	24	0	0	3.0	0.0	-0.1

APPENDIX I

1. The gross error limits for observation minus background differences of geopotential height in Tables 5, 10 and 11 are:-

Level (hPa)	Geopotential height (metres)
1000	100
850	100
700	100
500	150
400	175
300	200
250	225
200	250
150	275
100	300
70	375
50	400
30	450

The weighted RMS values used in Table 5,10 and 11 are calculated using the following weights:-

Level (hPa)	Weight
1000	3.70
850	3.40
700	2.90
500	2.20
400	1.90
300	1.60
250	1.50
200	1.37
150	1.19
100	1.00
70	0.87
50	0.80
30	0.64

2. The gross error limits for observation minus background differences of windspeed in Tables 6,12 and 13 are:-

Level (hPa)	Windspeed m s^{-1}
1000	35
850	35
700	40
500	45
400	50
300	60
250	60
200	50
150	50
100	45